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Collaboration for Efficiency

AN encouraging development in labour relations on British Railways is the unanimous agreement last week of the British Railways Productivity Council on intensifying efforts made by management and employees' representatives to improve productivity. The wage settlement between the British Transport Commission and the trade unions after the Railway Pay Committee of Inquiry (the Guillebaud Committee) was accompanied by a joint statement expressing a common determination to promote efficiency on British Railways. Work study is one of the best methods of achieving this aim. Railways in this country were quick to apply the new techniques, for a start was made in 1947, and now more than 30,000 of the staff are employed on jobs subjected to this study, which is the largest total covered by work study schemes in any single organisation in Europe. Training centres have been established through which 1,300 railwaymen have been trained in work study methods, which are being applied throughout the system, either direct to current operations or in planning new projects, and good progress has been made, more particularly in the field of civil engineering. The British Railways Productivity Council, which consists of representatives of the British Transport Commission and of the unions, has examined the problems to be solved to enable work study to be introduced more rapidly. Last week it stressed the need to accept at all levels that wider application could much improve productivity. First there must be readiness amongst all concerned to accept work study, and both the management and trade union members of the Council are issuing a joint appeal for co-operation throughout the industry. In the present state of employment, including shortages in many grades of railway staff, redundancy has lost many of its terrors ; but it is often in the background, and may well be made, by the less discerning railway worker, an excuse for opposing work study and any other measure which may be suspected of endangering his job. The results of work study properly applied eventually will be a railway service consisting mainly of skilled men working at more interesting jobs in more agreeable conditions, and, it is to be hoped, for a prosperous undertaking.

Freedom for Constructive Action

THE need of the railways for a period of quietude to enable them to carry out constructive plans was stressed by Mr. K. W. C. Grand, President of the Institute of Transport and Member of the British Transport Commission, and guest of the Retired Railway Officers' Society at their autumn luncheon at the Hotel Russell, London, last Tuesday. The presence at that function of many retired and serving railwaymen who long served the former railway companies, and of Sir Eric Gore-Browne, sometime Chairman of the Southern Railway Company, were a reminder of a past, and, for many, happier, epoch when railways in Britain were not subjected to distracting inquiries or to threats of re-organisation from outside, and were free to form and implement their own plans for improvements. There was a ray of hope in the suggestion by Mr. A. B. B. Valentine, Chairman of London Transport Executive, that the inquiries might result eventually in a financial reconstruction which would enable British Railways to function free of deficits—and so much enhance the morale of railwaymen.

Middle East Transport Problems Discussed

PLANS for completion of the rail link between Turkey and Persia were one of the many matters concerning transport in the Middle East discussed in London this week by the Sub-Committee on Communications & Public Works of the Economic Committee of the Central Treaty Organisation (CENTO), the successor of the Baghdad Pact. The meetings have been attended by representatives of the Governments of the United Kingdom, Pakistan, Persia, Turkey, and the U.S.A. The holding of these meetings in London has been a good opportunity for members of the sub-committee to renew, or make, contacts with British Railways and the British manufacturers of rolling stock and other equipment, and to see for themselves what new techniques in all fields of railway activity have been devised and are being applied with skill and energy on British Railways and by British industry. They were entertained last week at a cocktail party given by the United Kingdom Railway Advisory Service, which is the means whereby overseas administrations can keep themselves informed on railway practices in this country, both on British Railways and in the products of the railway equipment industry. Some CENTO sub-committee members took the opportunity to take a trip in the new "Midland Pullman" diesel train, and a demonstration was given of a British Railways Road-railer vehicle.

Peruvian Development Plans

THE Peru-Vía development plan, for which the Peruvian Government is seeking capital abroad, provides for construction of a hydro-electric plant on the Mantaro River in the Central Andes, with an initial capacity of 700,000 kW. A smelting plant and refinery for the lead and zinc mined in the region could then be built and powered by the electricity generated, and the Central Railway from the coast would be electrified from the same source, probably at industrial frequency. The scheme is being studied by a mission from Western Germany. Further projects cover a large area in Central Peru, where there are considered to be good possibilities of exploiting mineral and oil resources, and developing timber production and agriculture and cattle farming. The 4-ft. 8½-in. gauge

Central and Southern Railways, which at present are not connected, would be linked by an electrically-operated line to be built parallel to the coast, and fed by roads to be constructed to railheads. These communications are considered essential to any development plan. They would allow of imports of machinery and other essentials and provide an outlet for produce to the coast.

Clean and Tidy Railways

THE British travelling public by all accounts is one of the untidiest among communities which profess to respect cleanliness and tidiness. About 200 tons of rubbish is removed daily from stations throughout British Railways, and the task of carriage cleaning is aggravated by the state in which coaches are found even after occupation for an hour. The amount which an affluent society can spend on sweets, cigarettes, and so on no doubt adds to this. The magnitude of the problem and the steps being taken to solve it are described on page 519. The cleanliness of trains receives as much attention as present resources will allow, and with the gradual withdrawal of steam traction, and with reconstruction of stations and their attendant facilities, railway travel will become increasingly cleaner. None of these measures can prevent the incorrigible from dropping litter, though, strictly, this is an offence under either the Litter Act of 1958 or under railway bye-laws. The British Transport Commission hopes that friendly persuasion, backed by constant reminder through posters and cards to be displayed in the trains, will bring about an improvement.

Controllers' Course at Windsor

IN accordance with its practice of keeping certain senior members of the staff informed on current policy and methods, the Great Northern Line of the Eastern Region, British Railways, last week broke new ground by arranging a refresher course for some 22 of its controllers. The course was held on October 17-21 at the British Transport Commission School of Transport at New Lodge, Windsor. Students attended from Line Headquarters and from Kings Cross, Doncaster, Lincoln, and Sheffield Districts. The brief description on page 520 shows that a wide range of subjects was covered ; but comments and arguments were not allowed to be diffuse. Such keenness was shown that on more than one evening discussions were continued late, by request, instead of the film show which had been arranged. Apart from the syllabus the course provided an opportunity for men to meet and exchange ideas ; in a close-knit, but geographically widely dispersed, organisation such as the Great Northern Line, such meetings are of great value.

German Federal Railway Film on T.E.E.

A NEW 16-mm. colour film produced by the German Federal Railway to publicise the T.E.E. (Trans Europ Express) trains which connect 80 Continental cities is available on loan from the British Transport Film Unit at 25, Savile Row, London, W.1. Running for approximately 30 min. the film, which is entitled "Across the Borders," includes shots of the manufacture of T.E.E. trains as well as internal and external views of the finished products. It also contains attractive scenes in some of the towns served by the trains. T.E.E. trains are the result of an agreement reached between Belgium, France, Italy, Luxembourg, Netherlands, Switzerland, and Western Germany whereby the railway administrations of each of these countries form the T.E.E. Commission, the highest authority in the T.E.E. group. Although four types of diesel-electric multiple units at present operate the service, it is hoped to evolve a standard design embodying the best features of all trains in due course. The network is to be expanded by additional services—next year T.E.E. trains will run between Paris and Milan *via* the Simplon Tunnel and between Zurich and Milan *via* the Gotthard Pass.

A Century-and-a-half of Henschel

THIRTY-EIGHT years after the establishment of a small foundry by Georg Henschel in 1810 the first locomotive was built, under the direction of the founder's brother Carl Anton; but in the ensuing 112 years over 30,000 were built, and some 90 per cent were steam. This production raised the firm to the position of the largest locomotive builders in Europe, and it remained as a family concern until 1957. Before that, as early as 1925, diversification of products was begun, for by then the firm had three works at Kassel—the old shops in the city, the boiler shop at Dittenmold, and the then new works at Mittelfeld. Manufacture of trucks and buses was begun; then diesel engines were added, and from the war years an oil engine factory at Hamburg became part of the property. With the re-organisation of 1957-58 further changes were made. The Hamburg factory was given up, and manufacture of locomotives, heating boilers, fluid mixers, machine tools, road vehicles, earth-movers, and diesel engines is concentrated at Kassel. The financial ownership of Henschel-Werke G.m.b.H. today is held 27·5 per cent by F. A. Goergen, 27·5 per cent by F. A. Goergen and F. Grünewald jointly, and 15 per cent each by the Deutsche Bank, Commerzbank and Frankfürter Bank; but present proposals are to make the company into a public limited one of DM. 45 million capital.

One Hundredth Type " 4 " from Newton-le-Willows

THE Vulcan Foundry Limited at Newton-le-Willows, Lancashire, a member of the English Electric group, has completed its 100th 2,000-h.p. diesel-electric locomotive for British Railways, No. D.299, which left the works earlier this week for Doncaster where acceptance trials on behalf of the London Midland Region are being completed. With orders in hand for a further 100 similar locomotives for British Railways, the Vulcan Foundry Limited and the other factories in the English Electric group which supply power and transmission equipment are to be congratulated on the major contribution which they are making towards progress under the modernisation plan. These Type " 4 " units, which first began service in 1958 on the Eastern Region, have become an increasingly common sight also in the North Eastern and London Midland Regions, hauling long-distance express passenger trains. Named-trains with which they are now associated in the Eastern Region include " The Master Cutler," " The Talisman," and " The Norfolkman." In the London Midland Region, where they haul all express passenger services between Euston and Liverpool, several of the locomotives have been named after famous ships including *Empress of Britain* and *Mauretania*.

Modernisation at English Street

SPEAKING at the opening ceremony on October 21 of the newly enlarged and modernised goods depot at English Street, Hull, in the North Eastern Region of British Railways (see also pages 505, 506, and 522), Mr. T. H. Summerson, Chairman of the North Eastern Area Board, stressed his confidence in railway management and organisation, and his belief that British Railways bore within them all the elements which make an organisation successful. Although there were occasional differences among the staff these were insignificant compared with what was almost a day-to-day occurrence elsewhere. Much work and money had been put into the English Street modernisation and on the neighbouring docks, and Mr. Summerson urged his audience to make good use of the new facilities: not only would customers save money, but also save lives by taking unnecessary lorries off overcrowded roads. Freight could and should be carried competitively by the railways. Major J. B. Upton, High Sherriff of Yorkshire, spoke of the value of the road-railers used at English Street, and referred to the blending of the traditional and the modern at the new depot. Traditions were good, so long as they were used as a foundation and were not allowed to become a fetter.

Birmingham Snow Hill Re-Signalling

THE site of Birmingham Snow Hill Station where the new signalling has been carried out by the Western Region Signal Department, as described on pages 510-514, is confined, with steep gradients rising on both sides. The line on the Paddington side is in tunnel which forms a bottle-neck. One prior need, therefore, was to keep trains moving to the extent compatible with safety. This has been achieved. The

" entrance-exit " principle is in use, but the operating console has several points of distinction. First, it is of the " mosaic " pattern, designed by the Swiss firm, Integra A.G. This allows easy replacements or modifications. Secondly, the illuminated diagram on the console gives the signalman, in simple visual form, every kind of information that he requires. Finally, the train descriptions, shown on a second and modified diagram, are according to the Western Region new four-character train identification system.

Centenary of the Water Trough

WITH the decline of steam traction, the days of the water pick-up trough must be drawing to a close, but the device at least has survived a century. Surprising discrepancies, even in official publications, have obscured the date of its introduction. Research by Mr. Michael Robbins has established that the device for which John Ramsbottom, Locomotive Superintendent of the London & North Western Railway, applied for a patent on June 23, 1860, was first installed at Mochdre, near Llandudno Junction, to enable the running of the " Irish Mail " to be improved. It was brought into use in October, 1860, after an inspection by the L.N.W.R. directors on the 23rd of that month. The original trough was transferred to Aber in the latter part of 1871, and that equipment is believed to be the one still in service. Use of the device outside Great Britain has been limited. The U.S.A. had a few " track pans " from 1870 until 1956; they were first used by the New York Central, at Montrose (New York), in June, 1870, but the last on that system was removed in 1955. On the Pennsylvania Railroad the last pans were taken out of service in the winter of 1956, and removed from the track in November, 1957. On the Continent of Europe the sole user was the former French State Railways and its successor, the Western Region of the French National Railways, where they survived until a few months ago.

Development of Overhead Line Equipment

MANY problems of design have arisen in the application of the comparatively light overhead line equipment on the 25-kV. electrified routes in this country. Their solution has led to some interesting developments in the technique of overhead line construction.

Various forms of construction have been used for both single-mast and portal-type structures. In the single mast category, although the broad-flanged beam has been found to be the most satisfactory and cheapest design, tubular masts have been introduced on certain routes. These have better torsional characteristics than the flanged beam, and their first cost is not much greater; on the other hand, their resistance to bending is inferior. Another design which is being tried out on a large scale on one route consists of a light, tapered twin-channel mast which is cheaper in first cost than the single-flanged beam. For portal structures a special welded-rod design has been developed which has been found to be some 50 per cent cheaper in first cost than the more conventional rolled-steel lattice form of construction. Tubular construction of varying designs is also being tried out on certain routes. The booms are formed of four main tubular members braced either by welded rod or tube ; the masts are either of similar construction or formed of two large diameter tubes. For the smaller spans tubular construction costs are similar to those of rolled steel, but are appreciably cheaper for the larger spans.

Insulators with long creepage path have been used to reduce the frequency of the need for cleaning, 42-in. creepage being the usual figure for 25 kV., though 51-in. has been used in certain locations. In an area unaffected by atmospheric polution, insulators with a creepage of 23 in. are being tried out. A silicone grease coating is applied to insulators in smoky districts to reduce sparking and interference with radio. One of the most interesting developments in insulator technique is their extensive use under bending stress for supporting the catenary. This has allowed a reduction in height of structures and in clearances, and has resulted in the simplification of many parts of the overhead equipment. Two types of section insulator have been developed. One makes use of porcelain insulators in tension and compression and T-section copper runners, and is suitable for speeds up to 60 m.p.h. in one direction, and 25 m.p.h. in the other. The other type is designed for speeds in both directions up to 100 m.p.h. and consists of P.T.F.E.-coated glass-fibre insulation with toughened glass runners. In addition to its suitability for high speeds, it has the advantage of considerably lighter weight compared with the former type. A further important use of glass-fibre insulation at present under development is its application to neutral sections. It is planned to insert short lengths of this insulation in the catenary and contact wires, thereby eliminating the present heavy and complicated system involving the use of porcelain section insulators. The necessity for the provision of neutral sections at all points where changes of supply voltage or phase take place emphasises the importance of any means designed to secure a simplification of the equipment at these points with its consequent reduction in first cost and maintenance costs. Despite the remarkable strides made in the application of glass fibre for insulation, developments in the technique of ceramic insulation are by no means lagging, and attention is being given to the improvement in the properties of this form of insulation by the introduction of high-strength alumina ceramics and devitrified glass, and by variation in the manufacturing processes.

Resin adhesives, which are already widely adopted in the aircraft and other industries, are also being studied with a view to their possible use in insulator manufacture and in steel construction. Development of the compression joint has reached a stage where it can be relied upon in many components of the overhead equipment, allowing the bolted type of connection to be dispensed with. Examples of this technique may be found in the attachment of ferrules of steel, aluminium, copper and other metals to structural sections such as rods, tubes, and stranded conductors by means of hydraulic pressure. Another application is the use of compression joints for the termination of glass-fibre rod insulators. Various methods are used to preserve constant elasticity of the overhead line. A roller and plunger wire registration device has been developed for intricate layouts such as occur at large stations and crossovers. This is designed to withstand heavy radial loads without imposing a downward vertical force at the registration position. Sealing against moisture and dust is applied to all moving parts, a process which is also adopted for turnbuckles at wire terminations. The turnbuckle screws, which are greased, are enclosed in a galvanised steel tubular body sealed at each end by neoprene caps.

Steps have been taken to overcome difficulties caused by corrosion of screwed and bolted fittings when adjustments of the overhead line system become necessary. These consist of the introduction of special clips secured by cam operation for all catenary and contact wire clips, and certain other fittings. Besides meeting the corrosion problem they also simplify erection methods. The need for the protection of certain steel members of the overhead equipment has resulted in the development of new techniques. The protection of steel cantilever struts and steady arm tubes has been provided by copper cladding, the tubes being hermetically sealed by soldered copper or neoprene caps. A resin-based bituminous paint has also been developed and promises to be an effective form of protection. To meet the requirements for sectionalising the overhead line equipment various types of isolating switches have been introduced. New designs have been developed by individual manufacturers using standard components which can be assembled in different ways to produce the various types, all of which are actuated by a single design of motor-operating mechanism.

Development is now proceeding on designs of overhead equipment suitable for rural areas, which will be simpler, easier to erect, and cheaper in first cost and in maintenance costs. Features include considerable standardisation of components for the various types of structure, the use of compression jointing wherever possible, facility for rapid changing of insulators, and availability of maximum adjustment to erection and maintenance staff. The new cantilever design will make use of glass-fibre insulation and galvanised ferrous components. The rollers supporting the catenary at structures will be mounted on P.T.F.E./metal bearings instead of roller bearings as at present. A noteworthy development is a hydraulic system for wire tensioning. The wire is tensioned by a piston acting under fluid pressure in a cylinder having a length equivalent to the maximum variation in the length of the conductor caused by temperature changes. This method is considered to

be much cheaper and simpler than the weight tensioning system and has none of the disadvantages of the latter. Various schemes are under consideration to obtain the necessary electrical clearances under bridges and in tunnels without resort to costly civil engineering operations such as the lifting of bridges and lowering of tracks. These developments include the use of butyl rubber mats under bridges and tubular steel supporting arms with P.T.F.E. insulating sleeves.

Services for Exporters

ALTHOUGH most manufacturers are more export-conscious than ever before, there are very few who could claim to know all the answers in this complex field. Nor is the majority fully aware of the extent to which Government services can help. The services are centred on the London headquarters of the Board of Trade with the support of its regional and district offices in the United Kingdom and a world-wide organisation of trade and commercial officers. They are geared to serve the export interests of the whole of British industry and cater for large and small organisations, for those which are trying to make their initial entry into the export field, and for those which seek to expand their export activities.

The exporter's first point of contact with the Board of Trade can be the headquarters in London or one of the regional offices in the main provincial cities and in Scotland and Wales. The two London Departments most directly concerned are the Commercial Relations & Exports Department and the Export Services Branch. The first is generally responsible for overseas trade matters and is divided into sections dealing with commercial relations between the United Kingdom and individual overseas Governments. These divisions advise traders on market conditions, selling and distribution methods, competition, regulations such as tariffs, import licensing, exchange control, transport, seasonal fluctuations, and other matters of direct concern to the exporter.

The Export Services Branch is divided in sections on a commodity basis and is the point to which most queries of detail should be addressed. This Branch is equipped to deal with practically any kind of inquiry about particular products and is always ready to enlist the help of the men on the spot. These are Trade Commissioners, who are members of the staff of the Board of Trade, and Commercial or Consular officers of the Foreign Service. These officers provide liaison between the countries in which they are stationed, headquarters, and regional offices. They provide news about commercial and financial matters affecting local demands, would-be buyers, calls for tender, and so on.

This vital background news about markets abroad is circulated via the *Export Service Bulletin*, which is published three times weekly, and also in the form of a weekly supplement devoted almost exclusively to economic and market reports. This bulletin is available on a subscription basis to any company registered in the United Kingdom, to individuals provided they are resident and carrying on business here, and to trade associations, chambers of commerce, and trade periodicals. Inquiries should be addressed to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, E.C.1. The Export Services Branch provides other important free services. It maintains lists of importers in most countries, and provides a wide range of overseas directories, catalogues, and samples which may be consulted or examined at Lacon House. The Branch also keeps records about the standing activities, and influence of many overseas concerns, and will make specific inquiries on request. These are not credit reports (for which applications must be made to banks and other agencies) but they are useful in deciding the suitability of an overseas trader as a sales outlet.

To help the exporter who is unable himself to go abroad to choose and appoint an agent, the Branch can ask overseas officers to find suitable men. Details of promising contacts will be sent and personal negotiation can follow. The Branch advises on the most usual agency arrangements and can make recommendations where terms offered are not appropriate. Where the exporter wishes to go aboard and engage his agent personally, the Branch can save time by making preliminary inquiries. Those who want help of this kind should let the Branch have a description of the product with catalogues and samples, prices, discounts, delivery, territory to be covered, type of agent, and proposed terms. An indication of any previous experience of the territory and of any previous representation there is also useful. Information about special requirements of overseas markets sometimes can be illustrated by the overseas officers with specimens of overseas goods.

Answers can be given to questions about quotas, consular invoices and fees, certificates of origin, marking and packing of export goods, pure food and drug regulations, trade and merchandise marks, taxation of commercial travellers and their samples, and sales taxation. If the exporter is going overseas on business, and will let the Branch know in good time, overseas posts can be advised of his visit, and the relative overseas officer, knowing the local business community, can prepare the ground by arranging introductions; securing local publicity if required, and advising on local matters. In the United Kingdom, the Branch will issue letters of support to foreign Consulates for the grant of visas.

A booklet called "British Government Services for Exporters" can be obtained free on application to the Board of Trade, Export Publicity & Fairs Branch, Horse Guards Avenue, London, S.W.1. It contains much useful information, including a list of addresses and telephone numbers of the headquarters departments and Regional Offices.

The Export Council for Europe, to be formed under the auspices of the Board of Trade and the Federation of British Industries, will not only help exporters, but bring home to British industry the possibilities of the expanding markets of Continental Europe. Sir William McFadzean, President of the F.B.I., has accepted the chairmanship at the invitation of the President of the Board of Trade, Mr. Reginald Maudling. It will be an industrial as much as a governmental institution. An important feature will be the information on European markets and conditions which experienced firms can contribute to the fund of knowledge.

A Foolish Suggestion

THE issue of converting the railways of Britain into roads has been raised once more by the Railway Conversion League, which has submitted a memorandum* to the Special Advisory Group of the British Transport Commission, under the chairmanship of Sir Ivan Stedeford. It might have been thought that the facts of the amount of traffic moved by rail, and of the impracticability of converting a double-line railway, with bridges and tunnels, satisfactorily into a roadway more than 20 ft. wide, would have dispelled the fantasy once and for all.

The arguments put forward by the League may be summarised as follows: Railways in Britain, in their present form, are obsolete; and can no longer be competitive, no matter what re-organisation or investment may be undertaken. (This statement is made when railways are carrying more traffic than ever before, and as all people well know who are concerned with practical problems of moving large quantities of goods and passengers, cannot be replaced by any other form of transport for the traffics for which they are best fitted.) As public transport, the League states, the railways account for less than one-seventh of the total road/rail turnover of transport receipts; they can only hope to survive, other than at public expense, if road traffic expansion is halted. In the meantime, it is argued, the problem of road congestion is out of control. The conversion of railways to roads is stated to be a practical engineering proposition, for which there are precedents: various short lengths in Britain and the Pennsylvania Turnpike in the U.S.A. None of these is valid as regards main lines in Britain. Then follows the strange statement that converted railways would have a capacity sufficient for Britain's surface transport needs far into the future. One may wonder what thought has been given to the carriage of coal and minerals, for instance, and to the movement of hundreds of thousands of people daily in and out of large cities. Conversion, it is stated, offers the only solution of the most intractable traffic problem, that of urban motorways; and railway conversion offers a solution of the parking problem. As regards the cost of conversion the League uses as a basis the following actual estimates: conversion of 155-mile Inverness-Wick single-track line to 22-ft. road £36,000 per mile or £2·8 per sq. yd., and conversion of 21·9 miles of M. & G.N. Railway single-track line to 24-ft. road, £40,000 per mile or £2·84 per sq. yd. Both the above estimates involve con-

*The future of British Railways. The Railway Conversion League, Hallams Heath, Shawley, Surrey. Price 5s. post free.

siderable widening. The second estimate also includes provision for the purchase of additional land (£200 a mile) and the construction of two 8-ft. verges. The actual area of surfacing involved in converting the entire routes of the railway system, it is estimated, would be approximately 320,000,000 sq. yd. If a cost of £3 per sq. yd. is assumed the total cost would be £960,000,000. Experience of modern road making methods is said to indicate that very substantial savings may be possible on work such as that involved in railway conversion. The net cost of conversion, it is estimated, would not exceed £1,000 million and might be considerably less than this.

Space does not allow examination of the economics of operating the roads. But the fact that two men, a driver and a guard, are needed for a diesel-hauled train moving 1,000 tons of goods at 40 m.p.h., or an express conveying 350 passengers at 90 m.p.h., is not faced. The economics of railway operation are not examined on a proper basis, and those of road operation must remain largely nebulous. As to safety it is alleged that railways have no inherent superiority. Surely the report for 1959 of the Chief Inspecting Officer of Railways of the Ministry of Transport speaks for itself.

As to acceptability of the scheme, there are, apart from those with vested interests, a good many people who, in one way or another, are not only critical of the railways, but profess to wish them to be abolished. What, it may be asked, is the opinion of millions of passengers and consignors who rely on rail transport for good service—and usually get it? One can only regret that recent utterances by politicians should have led the Railway Conversion League mistakenly to think that there is even a remote possibility of its proposals finding favour among practical men.

British Transport Commission Traffic Receipts

MINERAL receipts of British Railways during Period 10, the four weeks ended October 9, are well up on last year's corresponding figure. The increase is not as great in proportion as for the preceding four weeks, for which it was 17·2 per cent.; but at £3,839,000 the total for Period 10 compares with £3,699,000 four weeks previously, and reflects increased activity in the steel industry. The rise of £1,033,000 in coal class receipts can be attributed, as for the previous period, to early movement to avoid possible difficulties during the winter. Merchandise traffic makes a better showing at £8,274,000, against £7,624,000 for Period 9. The increase of £155,000 over last year's figure is small, and not as great as for the previous four weeks, for which it was £544,000, or only 4·8 per cent. The movement, however, at least is in the right direction and may be expected to continue. Aggregate railway freight receipts for 40 weeks of the current year at £239,162,000 are £6,840,000 more than for these weeks of 1939.

	Four weeks to		Incr. or decr.	Aggregate for 40 weeks to		Incr. or decr.
	Oct. 9, 1960	Oct. 4, 1959		Oct. 9, 1960	Oct. 4, 1959	
Passengers—	£000	£000	£000	£000	£000	£000
British Railways ...	11,468	10,787	+ 681	119,297	110,856	+ 8,441
London Transport—						
Road passenger services	4,470	4,438	+ 32	43,671	42,051	+ 1,620
Railways	2,058	1,813	+ 245	19,819	18,081	+ 1,738
Provincial & Scottish buses	4,938	5,003	− 65	48,446	47,853	+ 593
Ships	593	742	− 149	6,528	6,700	− 172
Total passengers ...	23,527	22,783	+ 744	237,761	225,541	+ 12,220
Freight, Parcels & Mails						
British Railways—						
*Merchandise & livestock ...	8,274	8,119	+ 155	77,619	75,293	+ 2,326
*Minerals	3,839	3,531	+ 308	37,284	33,143	+ 4,141
*Coal and coke ...	9,050	8,017	+1,033	81,484	82,743	− 1,259
*Parcels, etc., by coaching train ...	4,509	4,354	+ 155	42,775	41,143	+ 1,632
*Total freight, British Railways	25,672	24,021	+1,651	239,162	232,322	+ 6,840
Others†	4,755	4,561	+ 194	44,052	42,133	+ 1,919
Total freight, parcels, & mails	30,427	28,582	+1,845	283,214	274,455	+ 8,759
Total	53,954	51,365	+2,589	520,975	499,996	+ 20,979

* Includes receipts from collection and delivery and from railway freight traffic within Commission-owned dock areas.
†Inland waterways freight, road haulage and ships.

Inland waterways, freight road haulage, and ships' cargo receipts were £4,755,000, or only £194,000 more than a year ago, but slightly exceed £4,670,000 for Period 9. As no details are published, it is impossible to comment. The greater part of these receipts was derived from road haulage. The total freight, parcels and mail receipts of the British Transport Commission for the 40 weeks at £283,214,000 exceed last year's figure by £8,759,000.

British Railways passenger receipts at £11,468,000 are less than for Period 9, which latter included summer holiday traffic, but was disappointingly low. The increase of £681,000 over Period 10 of 1959 is mildly encouraging. The pattern of London Transport Executive Underground and bus receipts resembles that of the preceding four weeks. Provincial and Scottish bus traffics again are down on last year, but the difference, £65,000, is not so great as the £140,000 in respect of Period 9. The unofficial shipping strike no doubt caused the drop of £149,000, against the 1959 figure, in ships' passenger traffics.

Total traffic receipts of the Commission for Period 10 are only £2,589,000 more than a year ago, and the aggregate for 40 weeks exceeds last year's total by £20,979,000.

PERCENTAGE VARIATION 1960 COMPARED WITH 1959

	Four weeks October 9	40 weeks to October 9
British Railways:		
Passengers	+ 6·3	+ 7·6
Parcels	+ 3·5	+ 3·9
Merchandise & Livestock	+ 1·9	+ 3·0
Minerals	+ 8·7	+ 12·4
Coal & Coke	+ 12·8	− 1·5
Total	+ 6·6	+ 4·3
Ships (passenger)	− 20	− 2·5
British Road Services, Inland Waterways & Ships (cargo)	+ 6·4	+ 3·1
Road Passenger Transport Provincial & Scottish ...	− 1·2	+ 1·2
London Transport:		
Railways	+ 16·8	+ 9·6
Road Services	+ 0·7	+ 3·8
Total	+ 4·4	+ 5·5
Aggregate	+ 5·0	+ 4·1

The U.S.A. Railroad Network

(By a correspondent)

AT the end of 1959 the U.S.A. had 109 privately-owned Class 1 railroads, each having annual gross revenues of $3 million or more. Thirty of these railroads operate more than 2,000 miles of road apiece and the total route mileage spread over 49 states was 219,520. In September the Bureau of Railway Economics, Association of American Railroads, published an analysis showing for each state the miles worked by the individual railroads within its boundaries and the percentage the figure bears to the entire mileage of each line.

In order of priority, the four States with the largest mileage were Texas, Illinois, Pennsylvania, and Iowa. Fourteen railroads operated 15,000 miles in Texas, the largest state in the Union, with an area of 266,000 square miles. The Santa Fe alone worked 3,640 of its 13,000 miles of line in the "Lone Star State." The Texas and New Orleans was not far behind with 3,433 miles, 84 per cent of its road.

Illinois is nearly as large as England and Wales. The phenomenal growth of Chicago as the main exchange centre for traffic between the regions east and west of the Mississippi accounts largely for 29 railroads, whose total mileage is nearly 130,000, operating 12,250 miles in the state. There are about 8,000 miles of railway track in the Chicago terminal district, including about 200 freight yards which can accommodate over 200,000 wagons—and last year the average capacity of American wagons was 55 short tons. The Illinois Central, often styled "the main line of Mid-America," worked less than a third of its 6,500 miles within the state, while the Burlington operated 1,670 miles, or 19 per cent of its line, and the New York Central 892 out of 10,370 miles of road.

The Pennsylvania Railroad was in prosperous times noted for its dense freight traffic, especially on the 664 miles between New York, Philadelphia, Washington and Harrisburg, electri-

fied before the second world war. Last year the P.RR. operated 3,854 miles, nearly 39 per cent of its whole road, within the state founded by William Penn. The rest of the famous railroad is located in 13 states from Michigan in the north to Virginia in the south-east. Almost all the Reading's mileage of 1,300 and 977 miles of the 5,911 miles forming the Baltimore and Ohio line are in Pennsylvania. At present these three railroads are hit severely by a setback in the steel industry which furnishes much of their traffic.

Twelve railroads operate 8,816 miles in the agricultural state of Iowa, a hundred more than 17 railroads use in Ohio, with its great mineral and manufacturing resources. Known as " the prairie state," Iowa provides easy routes to the west for services run on 7,000 miles by the Rock Island, Milwaukee, Burlington, Chicago and Northwestern and Illinois Central from Chicago. In Ohio the N.Y.C., P.RR., and B. and O. work 5,784 miles, but the other lines do not penetrate the state for long distances. The greatest mileage operated by any railroad in one state was 3,986, worked by the Southern Pacific in California, where the Santa Fe, Union Pacific and Western Pacific were competitors for transcontinental traffic.

Another point of interest was the operation of 1,299 miles by U.S.A. railroads in Canada. The New York Central, Chesapeake and Ohio ran trains on Canadian soil north of Lake Erie from the neighbourhood of Detroit to Buffalo. The N.Y.C. also reached Ottawa and Montreal by branch lines, while the Great Northern used 205 miles of road to serve Winnipeg and Vancouver.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A.C. and D.C. Multiple-Unit Stock

October 12

SIR,—The article in your October 7 issue on the three- and four-car trains of a.c. multiple-unit stock for British Railways, Eastern Region, services from and to Liverpool Street, caused me to wonder when the designers of coaching stock would consider the comfort of passengers.

Recently, and for the first time, I travelled in the new stock, the subject of an article in your issue of October 23, 1959, on the Manchester-Bury line of the London Midland Region electrified at 1,200V. d.c. At every stop doors slammed, people tripped over one's feet, reading or conversation was disturbed, and there were draughts. Many passengers were stepping on to the platform when the train was still moving and there was danger to people on the platform from doors being thrown open before the train had stopped. From the passenger point of view this stock is virtually of the same design as that described on October 7 last.

There is a vast difference in the standard of passenger comfort and safety between this type of stock and the trains on the Liverpool Street-Chelmsford, Manchester-Hadfield, Liverpool-Southport, and Glasgow suburban services. In these the doors are sliding and controlled by the guard; there is plenty of room to stand and no draughts, no disturbance to passengers, and no danger to those alighting or waiting on the platform; and prams can be placed in or removed from the cars easily, without disturbing their occupants.

Yours faithfully,

G. RICHARD PARKES

The Thorns, Hadfield, Manchester

Sydney-Melbourne Express Services

October 23

SIR,—The article on the new rolling stock for the Sydney-Melbourne through service in your October 21 issue shows how far Americanisation has gone on what used to be one of the most English of overseas systems.

The two cities together have a population of not far short of 4,000,000, which should provide a very considerable traffic potential, but the 590 miles separating them are about as tough a railway proposition as one could hope to meet and the trains face intense air competition subsidised to the extent of some £3 a passenger. There are also millions of private motorcars. Goods traffic is seriously affected by the somewhat absurd feature of the Constitution which does not permit the States of the Commonwealth to interfere with, or control, road transport which crosses a State border.

Despite the present break of gauge, the Melbourne-Sydney passenger service has long been good. A passenger from Melbourne travelled the 191 miles on the Victorian Railways to the border non-stop in 3 hr. 50 min., and then had 20 min. to change into the comfortable sleeping cars of the New South Wales Government Railways train which landed him in Sydney 10 hr. later, the overall time from Melbourne to Sydney being just under 14½ hr.

On the Victorian Railways, for 120 miles south from the border the line is single and of heavy construction. It would have been very simple to have converted it from 5 ft. 3 in. to standard gauge. Instead, a new line has been built alongside with a capital outlay sufficient to kill the entire scheme economically. In any system not dominated by American thinking, the new line would have been wired for electrification from the outset with motive power sufficient to meet any likely weight or volume of traffic. Instead of this, operation will be handicapped by diesel power of an absurdly inadequate h.p., rated at 1,800. No wonder that even with the elimination of the break of gauge the new service will be not much more than one hr. faster than it was 20 years ago.

Yours faithfully,

L. IRVINE-BROWN

Ivydene,
Tilston, Malpas, Cheshire

Signalling at Junctions

October 22

SIR,—Reading the summaries of the Ministry of Transport reports on the accidents at Borough Market and Slade Lane Junction in your issues of August 5 and September 9, I am struck by an aspect of safety working which I think calls for some explanation. The two accidents were very similar, in that they both involved trains converging from parallel tracks as a result of one of them over-running a signal at danger.

My limited knowledge of signalling stems from experience of a Class I main-line junction box which I was allowed, quite unofficially, to operate, when a schoolboy some 30 years ago. The box was fully interlocked, and I could not have contrived an accident had I tried to do so. When two trains were converging the one to be stopped was normally held at the signal before that immediately protecting the point of convergence. Thus there were two signals at danger protecting the junction.

Alternatively, if for any special reason the train to be held were brought forward, after being checked at the previous signal, to the signal immediately protecting the junction, the signalman had to satisfy himself that it had actually come to rest before clearing the signals for the other train, which was taking precedence. In other words, the two trains must not both be moving towards the junction at the same time within the section.

In neither of the reports as summarised by you did the Inspecting Officer refer to these safety rules. Am I to infer that in the intervening years these rules have been relaxed or abandoned ?

Yours faithfully,

F. CLIFTON SHERRIFF

Myrtle Farm,
Ropley, Alresford, Hants.

[Both these accidents occurred in areas where colour-light, *i.e.* multi-aspect, signalling is installed. Rule 39 (a), which lays down that where a train is to be stopped at a signal, it must be brought nearly to a stand, at the preceding signal if worked from the same box, does not apply to multi-aspect signals. In each case, before reaching the red signal, the driver would at the least have had one yellow and one double-yellow signal.—ED. *R.G.*]

THE SCRAP HEAP

German Railway Venture in China (1900)

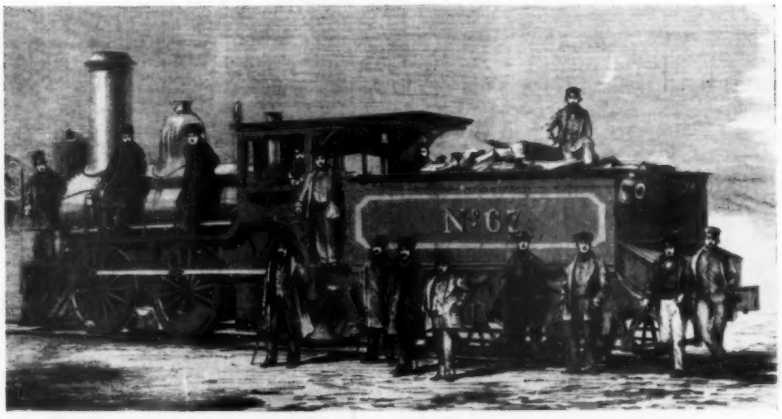
The inspired German Press is at pains to show that the agreement whereby Germany and Russia have undertaken the administration of the Tientsin-Taku Railway has no political significance. The reason of the step, asserts one paper, is unknown here but it may be assumed that the officers in command have deemed it advisable owing to the uncertainty of communication.—*From "The Financial Times" of October* 15, 1900.

Disused Station as "Adventure Centre"

Kerne Bridge passenger station, on the banks of the Wye on the Ross-on-Wye to Monmouth line of the Western Region, British Railways, was opened recently by Sir Brian Robertson, Chairman of the British Transport Commission, as an "adventure centre" for boys. Passenger services were withdrawn from the line some time ago. The premises have been leased to the National Association of Boys' Clubs as a base for expeditions in the Wye Valley and Forest of Dean. Bunks have been erected in the waiting rooms and a sink and gas cooker installed in the booking office.

Engine Nameplate for Football Club

Mr. G. B. Gray, Divisional Traffic Manager, East Midlands Division, London Midland Region, recently presented, on behalf of British Railways, the nameplate and football emblem from the splasher of "B17" class 4-6-0 locomotive *Nottingham Forest* to the Nottingham Forest Football Club. The plate and emblem are mounted on a mahogany board with two small panels in the club colours on each side. The plaque has been placed in the directors' room at the City Ground. The illustration shows the unveiling by the Lord Mayor of Nottingham, Councillor R. E. Green, with (left to right) Mr. Gray, and Messrs. G. Smalley, President, G. Noel Watson, Secretary, and H. W. Alcock, Chairman of the club. The engine was built in 1934 to the design of Sir Nigel Gresley, Chief Mechanical Engineer of the London & North Eastern Railway, and at one time worked London to Norwich services. A similar plaque, from the locomotive *Norwich City*, was presented to the club of that name by the Great Eastern Line of the Eastern Region and unveiled by Mr. W. G. Thorpe, Line Traffic Manager, in November, 1959—after an evening match with Nottingham Forest. By a coincidence Mr. Gray, during his traffic apprenticeship on the L.N.E.R., acted as fireman on *Nottingham Forest*.



Great Western Railway of Canada goods engine constructed at Hamilton (Canada West) in 1860, *the first Canadian-built locomotive*

Steam Locomotives in Canada

The year which marks the centenary of the first Canadian-built locomotive sees also the end of steam traction on the two principal main-line railway systems, the Canadian National and the Canadian Pacific. One hundred years ago trade in Canada was suffering as a result of poor harvests in what was primarily an agricultural community. Slack times caused the Great Western Railway of Canada to use its repair facilities at Hamilton (Canada West) to build the first locomotive constructed in Canada. It was an 0-6-0 goods engine designed by Richard Eaton, the Locomotive Superintendent, and was named *George Stephenson*. The illustration is from a contemporary woodcut. The C.N.R. (successor of the old Great Western) closed its steam era on April 25 last. The C.P.R. ran its last scheduled main-line steam train on May 1; some Montreal suburban trains were steam operated until May 28, and a few steam locomotives were used for yard and freight duties, but by July 24 every steam locomotive had been withdrawn from service on the C.P.R. system.

Photo] ["Nottingham Evening Post"

Unveiling at Nottingham City football ground of nameplate of "B17" class 4–6–0 locomotive "Nottingham Forest"

Preserving a Webb 0-6-2 Tank

A fund to buy the last of F. W. Webb's 0-6-2 side tank coal engines, built in 1888 for the London & North Western Railway, has been started by a Sussex enthusiast. . . . He needs £666 to complete a deal with the British Transport Commission and "save this gentle and homely relic of a more tranquil age from the oxy-acetylene cutting apparatus." If he gets the money the locomotive, No. 1054, will be painted in its original livery and exhibited by one of the railway preservation societies.—"*Peterborough*" *in* "*The Daily Telegraph.*"

Mobile Changing Room

It was standing room only in the changing room at British Railways' football ground at Rochdale recently, so two players nipped into a coach on a siding to change. After a 4-1 victory they found their changing room had been shunted away. Telephone calls were made to try to find it. Just as they were getting ready to go on duty in maroon-and - yellow shirts and white shorts their clothes were found—in an inspector's office at Rochdale Station, a mile away.—*From "The Sunday Express."*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Acceleration Through Track Improvements

The diesel railcar service between Auckland and New Plymouth, 300 miles, is to be accelerated by 30 min. from October 31, as a result of completion of a programme of track renewal and strengthening on the line between Stratford and Okahukura. This has enabled speed limits to be relaxed by 10 m.p.h. over most of the distance. Timings by the faster railcar services between Auckland and New Plymouth are being cut to a little over 9 hr. each way.

Porirua-Plimmerton Doubling

The new double line between Porirua and Mana and the new Paremata railway bridge are to be opened on November 7 by the Minister of Railways, Mr. Michael Moohan. This is the first and most important stage of the Porirua-Plimmerton railway duplication scheme; doubling and re-location of tracks between Mana and Plimmerton will be completed later. On the same date, a new suburban train timetable will be introduced with a basically hourly service during the day between Paekakariki and Wellington, and a half-hourly service between Porirua and Wellington.

WESTERN AUSTRALIA

New "Australind" Express Set

The new style "Australind" express went into regular service on the Perth-Bunbury run on October 1. The buffet car, from which light refreshments are served, has been extensively modernised, with extensive use of stainless steel and quilted plastic.

All passenger cars have been carpeted and curtained throughout and painted in pastel shades of oyster blue, pinks and creams. The exteriors of both the train and the diesel-electric locomotive are painted in cream and green. The time for the train's 115-mile journey has been reduced to 3 hr. 5 min., making it the fastest train on any 3-ft. 6-in. gauge in Australia. The timetable was cut by 35 min. when the maximum speed was increased last year from 45 to 50 m.p.h. This was made possible by improved track and by the operation of C.T.C.

With the exception of Wednesdays, the "Australind" express leaves Perth at 9.30 a.m. daily excepting Sundays and arrives in Bunbury at 12.35 p.m. It stops en route for passengers travelling to Collie and to points south of Bunbury. On the return journey, the "Australind" leaves Bunbury at 3.5 p.m.

VICTORIA

Construction of Brakevans

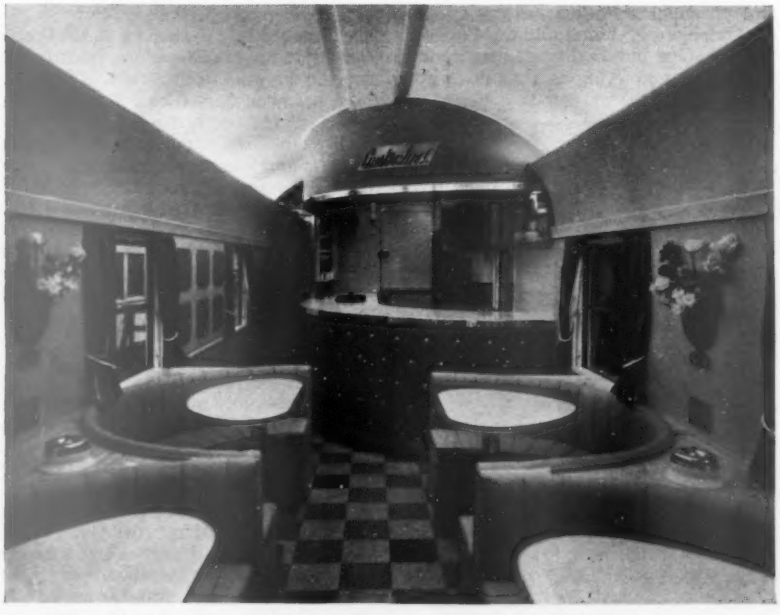
Fifteen bogie type brakevans fitted with a periscope instead of the old-style canopy, are being built by the Victorian Railways. Another feature of the construction is the use of plastic impregnated fabric as a roof protective covering. It is anticipated that its life will be appreciably longer than that of materials at present being used on wooden roofed vehicles. Other innovations are that the guard's compartment will be fitted with a pressure flush toilet, wash basin, and heating stove. The periscope will allow the guard to view the track in either direction while sitting at his desk. As a safety precaution the guard's side-doors of these brakevans have been made in two sections thus permitting departure signals to be given by merely opening the top section of the door.

JAPAN

New Diesel Trains

A new multiple-unit diesel train was recently delivered to the Japanese National Railways. It had its official test run on September 15. Two further sets are being built, and all three trains will be put into service on the Tohoku Line between Tokyo and Aomori on December 1, replacing the steam hauled "Hatsukari" Limited. The diesel trains will retain the name "Hatsukari."

The units are similar in appearance and interior accommodation to the multiple-unit electric trains "Kodama" and "Tsubame" operating on the Tokaido Line. They consist of nine cars; two first class, six second class, and a dining car. Total seating capacity is 472. A total of 14 underfloor-mounted horizontal diesel engines, each of 180 h.p., is fitted on a train. Each car, except the diner, is equipped with either one or two engines. The maximum speed is 70 m.p.h. Each train has three diesel-powered electric generators for supplying current for ancillary services. They are mounted on the dining car and the leading and trailing cars. When the trains go into service the time for the 470-mile journey will be reduced by about 1 hr.



Buffet car in the new style "Australind" express of the Western Australian Government Railways

VIET-NAM

Main-line Rehabilitation

Repairs to the main lines of the Viet-Nam Railways in South Viet-Nam, which were considerably damaged during the 1941-45 war and the civil war, have recently been completed so as to permit the operation of through services. A $6,000,000 loan from the United States will facilitate the purchase of diesel locomotives, and wide-scale electrification is also envisaged.

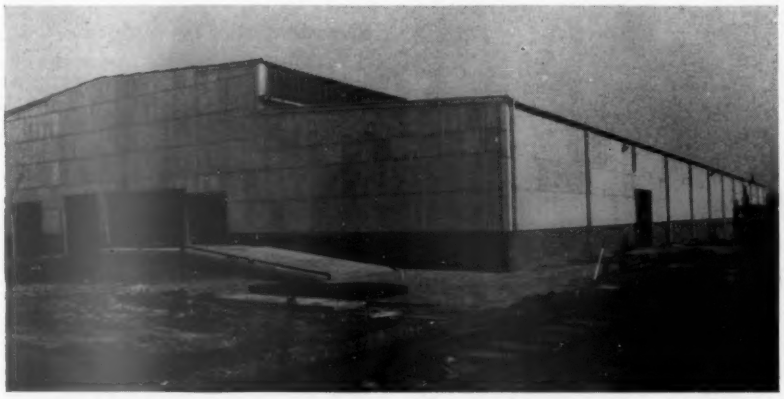
ARGENTINA

Tenders for Underground Stock

Buenos Aires Transport will shortly call for tenders for the supply of 80 underground railway coaches, for use principally on the new Plaza Mayo-San Jose-Boedo line. At the same time, tenders will be invited for 150 high-speed P.C.C. type trams for the long-distance surface routes. A start is being made very shortly with the transfer of bus lines to private ownership. The first lines to be affected will be those in the Avellaneda district and it is expected that the men will form co-operative societies to take them over.

Central Goods Depot at Hull, North Eastern Region

Modernised installation for less-than-wagonload traffic serving city, docks, and surrounding area



Inwards shed showing entrance through which railway wagons are drawn by capstans and fairleads

THE former English Street Goods Depot at Hull, North Eastern Region, British Railways, has been enlarged, modernised, and equipped with mechanical handling apparatus, and is now known as Hull Central Goods Depot. It was opened on October 21, as illustrated on page 522, and is one of the seven main goods traffic centres in the North Eastern Region plan for rationalising freight facilities.

The new depot deals with less-than-wagonload consignments for the whole of the city, including the docks, and also a wider area including Brough, Willerby, Beverley, Withernsea, and Hornsea. Frequent collection and delivery services, provided by a fleet of 123 road vehicles based on the new depot, link all parts of this area with the daily express goods train services running to and from principal centres in Britain.

Reduction in Number of Depots

There were, in the days of horse-drawn road vehicles, more than 1,000 depots handling smalls in what is now the North Eastern Region of British Railways. All this traffic has since been concentrated at fewer than 100 such depots. It is planned to reduce these until the whole of the traffic is concentrated in 29 mechanised terminals, seven of which, including Hull Central, are to be main concentration centres. Radiating road motor services will provide collection and delivery services.

English Street Depot was built more than 80 years ago by the Manchester, Sheffield & Lincolnshire, later Great Central, Railway, to serve the city and its immediate suburbs. Recently it has handled only outgoing traffic, and incoming traffic has been dealt with at the Railway Street Goods Depot.

Industrial development has brought heavy increases in the rail traffic passing to and from the city and port of Hull. Facilities at the old depots had become inadequate, costly in operation, and generally unsatisfactory. With the development of the plan for concentrating freight traffic in fewer but bigger and better terminals, the provision of a completely modernised depot became urgently necessary. This also presented an opportunity to introduce efficient handling methods with consequent improvement in services and reduction in working costs.

Outwards and Inwards Sheds

The existing shed at English Street has been modernised and equipped for handling all outgoing smalls traffic, and a completely new shed, alongside, equipped with a mechanical slat conveyor system, has been provided for handling incoming traffic.

The new shed is 460 ft. long and 150 ft. wide, providing a covered area of 70,000 sq. ft. The roof and walls are of corrugated asbestos sheeting supported on a steel framework. The mechanical slat conveyor, installed in a narrow decking, runs the full length of the shed. Traffic is discharged from incoming railway wagons and loaded on to the conveyor, on which it travels to the road vehicles, which in turn deliver to the traders' premises. Equipment includes a 30-cwt. overhead travelling crane.

Inwards Shed

The inwards shed is 460 ft. long and 150 ft. wide. It is built alongside the former English Street Goods Shed on a site previously occupied by a timber loading yard and cattle pens. The structure is steel framed with cladding of corrugated asbestos and patent glazing surmounting low brick dwarf walls. The slightly pitched roof has a main span of 100 ft. and a lean-to side span of 50 ft.; transparent corrugated sheets are set into the roof at intervals.

An electrically-driven slat conveyor 452 ft. long and 3 ft. wide is set into the deck of an 8-ft. wide raised platform running the length of the shed. It is controlled from a panel at one end of the shed and is capable of a wide variation in speed according to requirements of the traffic. Emergency stop buttons are positioned at points along its length.

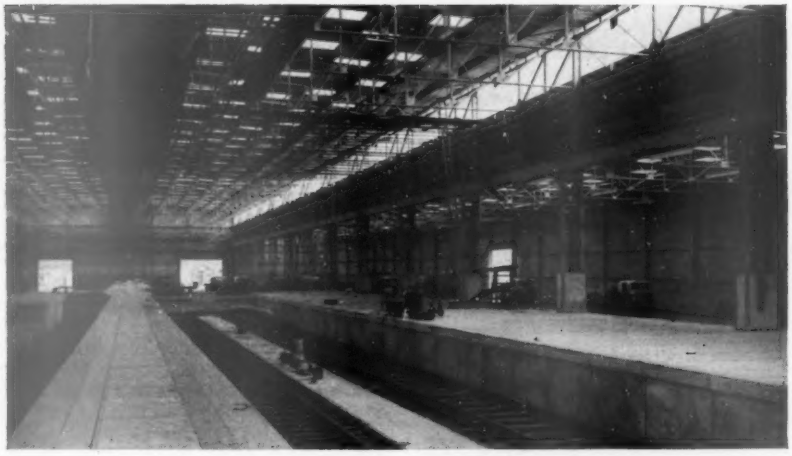
The conveyor platform serves 58 motor vehicle berths at the despatch and 20 railway wagons at the reception end. The use of two sidings, one on either side of the conveyor, avoids the interruption of work which would otherwise occur during the movement of railway wagons.

Traffic for Shipment

Incoming traffic for shipment is segregated and a third siding serving a separate platform has been provided especially for handling this important traffic. This platform is 25 ft. wide, 228 ft. long, and has berths for 10 railway wagons and 29 motor delivery vehicles.

Outside the reception end of the shed incoming loaded wagons are accommodated on five holding sidings. From there they are fed to the discharging berths by six electrically-powered capstans in con-

Office building in Kingston Street for Goods Agent and staff



Interior of inwards shed, showing (left) slat conveyor

junction with eight strategically positioned fairleads. These have a two-ton pull and a maximum controlled speed of working of 150 ft. per min. The whole area is floodlit from special overhead gantries spanning all the approach tracks.

Delivery services are, in the main, given by articulated motor vehicles. Three trailers are allocated to each powered unit and as each trailer becomes fully loaded it is moved from the conveyor to a parking area by a separate " vansetting " unit.

A 30-cwt. overhead travelling crane for awkward and heavy articles spans the main bay of the shed and runs its whole length.

The side-bay contains a lock-up compound for valuable articles and parking space for 43 road vehicles, with access to an outside standage and washing area on the south side of the shed.

Outwards Shed

The outwards shed, alongside the new shed for incoming traffic, is an existing structure converted to modern methods of operation. Conversion has involved demolishing the raised platforms and laying two additional concrete roadways, 30 ft. wide. There are now six sidings and three roadways with covered accommodation for 108 wagons. Siding accommodation outside the shed provides holding room for 152 loaded and empty wagons, while the nearby Belle Vue sidings act as a further reserve for 253 wagons.

A new road entrance has been made at the north-east corner of the building nearest the main entrance to the depot. The west gable has been rebuilt, using prestressed concrete beams and the design is such that the shed can in the future be extended if required.

Some 80 wagons are loaded daily in the shed to about 65 regular destinations, each line of wagons serving a particular area. In the line for the Scottish area the " Humber-Clyde " express goods train to Glasgow is made up. A certain amount of transfer traffic in railway wagons to and from local railheads and private sidings in the Hull zone is also dealt with in this shed.

Mechanical handling equipment includes a 1-ton battery-electric mobile crane with a searcher jib for lifting heavy or awkward articles into covered vans and a 1-ton capacity battery-operated fork-lift truck.

Lighting

Cold cathode lighting fittings are installed throughout the depot. The tubes are totally enclosed in dust-proof enclosures, the lower portions of which are composed of formed Opal Perspex.

Altogether 373 Trilite II cold cathode light fittings, each with an average light output of 7,500 lumens, are fitted throughout the installation. Roadways and yard are lit by 250-W. colour-corrected mercury vapour lanterns mounted on 25 ft. pre-stressed concrete columns.

To accommodate the increased circulation of road vehicles serving the two main sheds, a new roadway has been built from Kingston Street entering the yard near the new shed under the overbridge that carries Manor House Street into the dock area. The roadway is 12 ft. wide and caters for incoming traffic only; there is thus a one-way circulation system inside the yard. A new motor weighbridge and weigh office has been constructed near this new entrance.

Office Accommodation

An important part of the modernisation scheme at the depot is the provision of modern accommodation for the Goods Agent and his staff. This has been achieved by building a new two-storey office block; and by modernising and remodelling the interior of the former office block which was not large enough to serve all the needs of the new depot of which it is now a part.

The new office block on the corner of Kingston Street and Manor House Street provides 5,160 sq. ft. of office space. Besides the personal offices of the Goods Agent and his assistants, there are five general offices for the depot staff.

The telephone exchange has two manual switchboards which operate separate groups of extensions for the internal railway network and those connected to the Hull Corporation network. Later the two switchboards are to be integrated to operate 27 internal extensions, 12 Hull Corporation exchange lines and 13 telephones on an internal intercommunications circuit. An electric pulsynetic clock system comprises a master clock, 21 " slave " clocks and two time recorders.

Reconstruction of Two-storey Building

The two-storey building, formerly the main offices of the English Street Depot, has been reconstructed to provide: (a) an additional 1,443 sq. ft. of office space; (b) amenities for depot staff; and (c) office accommodation for the Yardmaster and his staff.

The offices on the ground floor include a registration office, with microfilming unit for consignment notes, an inwards and a cartage office. There are also offices for police, checkers and foremen.

The amenities section includes a large messroom in two sections, with fully equipped kitchen behind a glazed screen. The washing room has two treadle-operated wash fountains with hot water thermostatically controlled to prevent scalding. Hot air dryers are mounted on the walls. Both office blocks are centrally heated, and to serve the radiator systems and supply domestic hot water a new oil-fired boiler plant has been installed in the basement of the older office building.

Wagon-load Traffic

To provide facilities for handling full wagon-load traffic, part of the former Railway Street warehouse has been demolished and a steel-frame asbestos sheeted roof now covers an area of 22,000 sq. ft. in which are three sidings with two tarmacadam roadways. Adjacent to this site an end-loading dock and approach ramp have been erected.

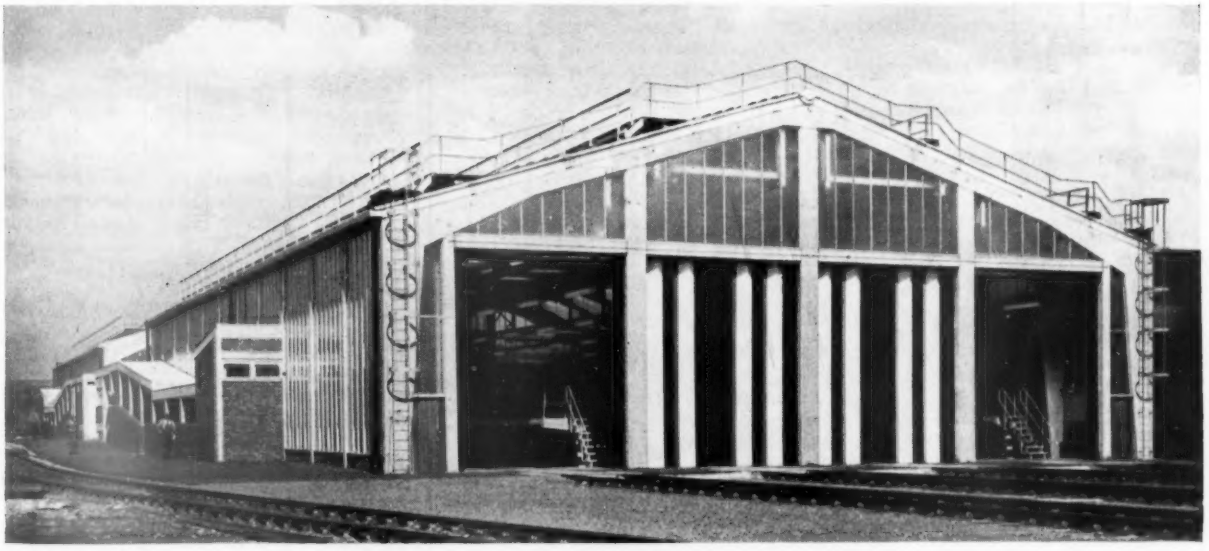
A new cattle dock has also been provided. With a separate entrance from Kingston Street, it has 12 pens with feeding and watering facilities. It is designed for the segregation of attested cattle and gives direct loading from each pen to wagons standing along each side of the dock. An office and fodder store are also provided.

The whole of the work was carried out under the supervision of Mr. A. Dean, Chief Civil Engineer, North Eastern Region.

CAR PARKS FOR AMERSHAM AND CHALFONT STATIONS L.T.E.—Two new station car parks with combined space for 171 cars have been provided by London Transport Executive at Amersham and at Chalfont & Latimer stations, on the Metropolitan Line. The Amersham car park was opened on October 21 with room for 103 cars, and that at Chalfont & Latimer will be opened on October 31, with room for 68 cars. The park at Amersham is on the south side of the railway line behind the new signal cabin. After parking their cars, motorists will be able to cross the station footbridge to reach the platform for trains to London. At Chalfont & Latimer the park adjoins the up side of the station. A new footpath from Bedford Avenue to the station entrance, with a side gate giving access to the car park, will enable motorists to reach the station from the park.

Stratford Diesel-Locomotive Maintenance Depot

First double-end shed in British Railways, Eastern Region, with centralised workshops, stores, and offices



General view of running and maintenance depot for diesel locomotives showing four-road entrance at south end alongside remaining portion of Jubilee steam shed

THE elimination of steam motive power in British Railways, Eastern Region, has reached the stage in which 61 per cent of all passenger services are operated by diesel and electric trains and only 39 per cent by steam. By next year, as part of the continuing development of the East Anglian diesel scheme, Stratford motive power depot, once the largest of its kind in the world with about 600 steam locomotives, will cease altogether to handle steam; it will deal solely with diesel power on the Great Eastern and the London, Tilbury & Southend lines.

Multiple-unit diesel trains will continue to receive maintenance in the specially-built three-track shed at Stratford designed primarily for that purpose and described in our December 5, 1958 issue, while the new 300-ft. long double-end running and maintenance shed which is the subject of this article, and to which editorial reference was made in our September 23 issue, will undertake all routine work on diesel locomotives. At present 73 diesel-electric main-line locomotives of Types "1," "2," and "4" are allocated to the depot; the number will rise eventually to 150.

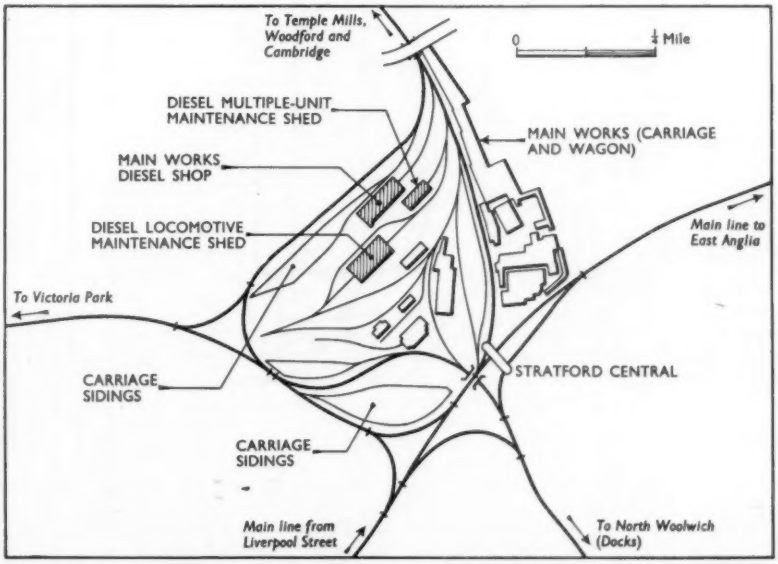
Site of Jubilee Shed

Situated on part of the site formerly occupied by the 70-year-old Jubilee shed, the new depot has provision for 16 main-line diesel locomotives under cover. As with Finsbury Park depot on the Great Northern Line of the Eastern Region, described in our May 20 issue, maintenance work can be carried out at two levels: from raised platforms when servicing power and control equipment at footplate level, and on a depressed floor when dealing with bogies and brake gear. There are eight tracks, four on each side of a two-storey workshop, office, and staff block which is placed across the centre.

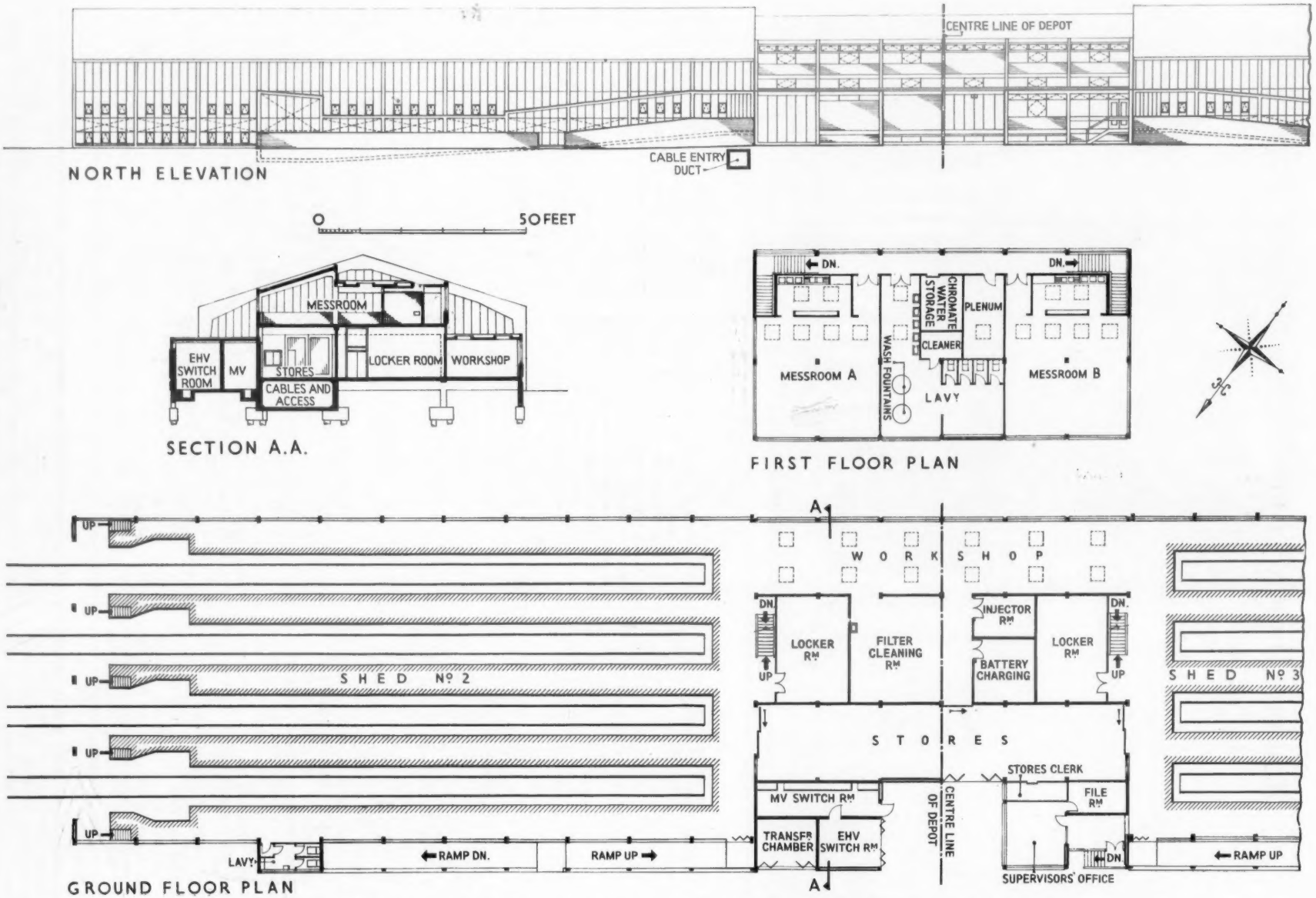
The twin sheds each have a precast reinforced-concrete frame with an 80-ft. span and the roofs are covered in double-skin asbestos cement sheeting with glass-fibre insulation. Inside, the tracks are carried on 5-in. dia. tubular steel supports at 5 ft. centres to give freedom of access from the lower floor to the pit. Working platforms, on precast concrete trestles, are 4 ft. 6 in. above rail level; the lower floor is 2 ft. 6 in. below rail level. The office and workshop block is framed with reinforced concrete: *in situ* on the ground and lower-ground floor and precast on the first storey. The infill panels throughout are of brick and glass.

Economic Operation

The use of short, dead-end tracks has the advantages that once a locomotive is in the shed there is usually no need to move it until maintenance work has



Stratford district showing the approximate relationship of some of the principal buildings for maintenance and repair work



Part elevation and plan of Stratford diesel-locomotive maintenance depot showing central grouping of all services

been completed. Also, as the workshops, stores, and offices are only a minute's walk from the locomotives, non-productive man hours are kept to a minimum. Only scheduled maintenance and running repair work will be performed so that work will not include such operations as the removal of an engine or generator. The normal practice is for locomotives to receive eight hours' maintenance every seven days ; about 16 hours' work is required on the fourth week. Inspections become progressively more comprehensive at the periodic three- and six-monthly examinations. Yearly examinations include heavy maintenance which is performed in the nearby main diesel works which were described in our June 26—August 14, 1959, issue.

Fixed Plant and Services

The new centralised workshop is provided with a 1-ton transporter hand-operated crane, filter-cleaning, injector-testing, and lubricating-oil testing equipment, steel benches, rough cleaning tanks, de-greasing plant, paraffin washing tanks, a small pedestal drill, and a tool grinder. There are also 15-A. earth-proved socket outlets for power tools, 50-V. socket outlets for hand lamps, and compressed air points.

Portable equipment provided to facilitate diesel-locomotive maintenance includes : battery chargers with four-position tappings to deal with all sizes of battery ; a pedestrian-operated electric battery truck for general carrying duties around the shed ; a special lubricating stillage with storage tanks for two oils and two greases (the stillage is equipped with compressed-air operated pumps and self-winding hose reels) ; a radiator-water stillage designed to hold the cooling water from a locomotive during repairs, the water being pumped back into the locomotive afterwards ; small transformers to enable the internal electric lights on the locomotives to be operated from the mains supply ; floor cleaning machines to both scrub and dry the floor and so prevent any accumulation of grease and dirt.

Domestic Facilities

In addition to the workshop, the centre portion of the shed contains the stores, locker rooms, messrooms, lavatories, and wash rooms. Socket outlets are provided to enable the floor-cleaning machines to be used extensively. Stores racks are equipped with tungsten-filament rack lights. In the messrooms electric cookers, water boilers, and hot plate ovens are provided. Wash rooms are equipped with electric hand driers.

There are 1-ton transporter hand-operated cranes also on the two outside roads, and overhead rails have been installed to allow for the provision of cranes covering all roads in future. There are power-operated folding/sliding doors at each end of the shed.

The detached boiler-house not only heats the new depot but also the multiple-unit shed. In the former, high-temperature high-pressure water is fed into 15-in. wide Brightrad panels suspended to form twin continuous strips over each platform, with secondary strips operated at lower temperature to heat the working areas underneath. In addition, a number of single-sided 8 ft. x 4 ft. panels are suspended adjacent to the main entrances.

Heat Distribution in Central Block

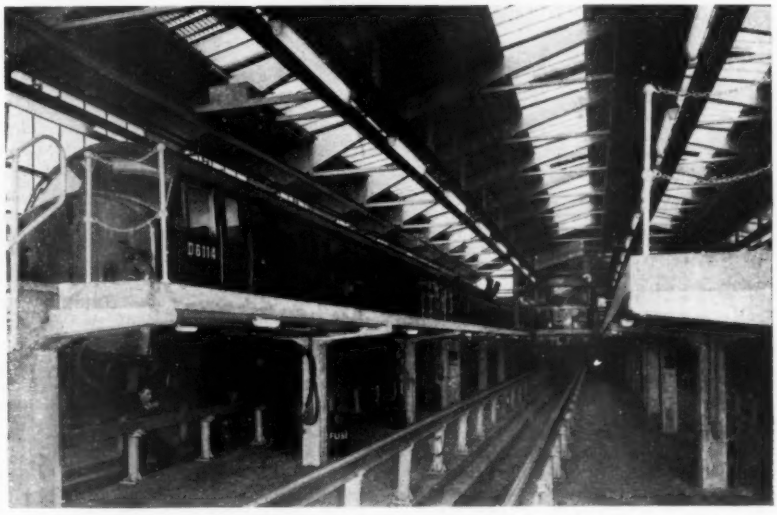
In the various sections of the workshop and amenities block, high-temperature high-pressure water is used as the heating medium. Strip panels are installed in the workshop and stores, pipe coils in the locker and cleaning rooms, and convectors in the offices. All the rooms on the first floor receive heat from a plenum system. There is a 150-gal. calorifier to provide hot water to the toilets and messrooms. During the winter period high-temperature water is used as the primary heating medium; during the summer a heavy-duty electric immersion heater is brought into use.

The two boilers are of the wet-back double-pass type with low water content and fully flooded. The hot water is drawn from the boiler and force circulated through the heating system by means of centrifugal pumps which are duplicated to guard against stoppage. The complete heating system is fully automatic. Situated in the boiler-house is a steam generator, heated by high-pressure hot water, for steam heating the rail tankers prior to off-loading boiler fuel. Two storage tanks, each of 9,000 gal. capacity, have a dual system of outflow whereby either high-pressure hot water or electric heating can be used. Contents gauges and high oil-level alarms are also fitted. Electrically operated fire valves are installed which can automatically cut off the oil supply to the burners in the event of fire in the boiler-house.

Patent Glazing

Natural lighting is provided by continuous runs of patent glazing, which go down to within about 6 ft. of ground level at the sides of the building. Electric lighting in the workshop and office block is by hot-cathode fluorescent fittings, designed to give a standard of illumination of 10 ft.-candles. Cold-cathode fluorescent lighting in the shed is designed to give a similar standard of illumination on the platforms. Their fittings are suspended from trunking between pairs of radiant-heating panels. Underneath the platforms lighting is by hot-cathode fluorescent bulkhead fittings, and in the pits oil-tight tungsten filament lighting is provided.

At both ends of the shed, yard lighting is to be provided by means of colour-corrected mercury-vapour lamps mounted on 25-ft. concrete columns, and throughout the yard by means of 50 ft. steel towers equipped with three 400-W. colour-corrected mercury-vapour fittings.



Concrete working platforms and rails supported on tubular-steel columns flanking deep central inspection pits

Ventilation is by Colt apparatus; special free-opening ventilators are also fitted for use when it becomes necessary to run engines inside the depot. For this purpose locomotives are positioned with exhaust outlets directly below the ventilators.

Power Supplies

Alternate roads in the shed are equipped so that each locomotive berth is covered by a 30-A. earth-proved power point for battery charging, two 15-A. earth-proved socket outlets for electric tools, one three-phase 15-A. earth-proved point for special tools, and two 50-V. socket outlets for use with portable hand lamps.

Two 60-A. earth-proved socket outlets are provided at each end of the depot to cover the inner berths so that portable electric welding equipment can be used. An electric substation has been established in the building to serve the whole of the motive power area.

A locomotive fuelling installation on the outlet roads from the depot includes three 50-gal.-per-min. diesel-oil dispensers, each with a pre-setting meter equipped with a ticket printer. Existing storage capacity has been extended by two further 25,000-gal. tanks to give a total of 150,000 gal. Facilities are pro-

(*Continued on page* 514)

New Signalling at Birmingham Snow Hill, Western Region

Entrance-exit switch and push-button system mounted on panel consisting of small domino segments

FIFTY years ago, two power signal-boxes, North (224 levers) and South (96 levers), were installed at Birmingham Snow Hill Station, by the then Great Western Railway. The frames were of the Siemens miniature lever type, and all facing points were then operated by Siemens point machines, " in and out " movement, with 50 ft. lock bars. There were then no track circuits.

As the years went by, limited track circuiting was provided, the lock bars were removed and Metropolitan-Vickers—G.R.S. 5A point machines and contactors were installed. In recent months some of the original motor-operated semaphores were changed to colour-light signals, in preparation for the new scheme. The old boxes gave good service, but as time went on, they fell due for renewal, In 1956 a re-signalling scheme was authorised.

Control Room on Down Platform

The new control room, constructed to harmonise with the existing station buildings, is situated at the south end of the down island platform. It houses the new control panel working on the " entrance-exit " principle. The panel of the mosaic or domino pattern was designed by Integra A.G., of Wallisellen, Switzerland, and supplied by its British associates, Henry Williams Limited. The installation came into operation on September 11, 1960.

The new box controls a compact area, consisting of Snow Hill Station itself and the connections and sidings at each end. From the traffic aspect two factors must be considered. The first is that the station lies on the top of a hill, with a rising gradient into it from each end. From Moor Street through the tunnel to the London end of Snow Hill Station the gradient is 1 in 45.

Track Layout

The second factor is that the tunnel creates a bottle-neck. Northwards, towards Wolverhampton, there are four tracks, down relief, up relief, down main, up main, in that order. Southwards through the tunnel there are only two tracks; there are four tracks beyond Moor Street

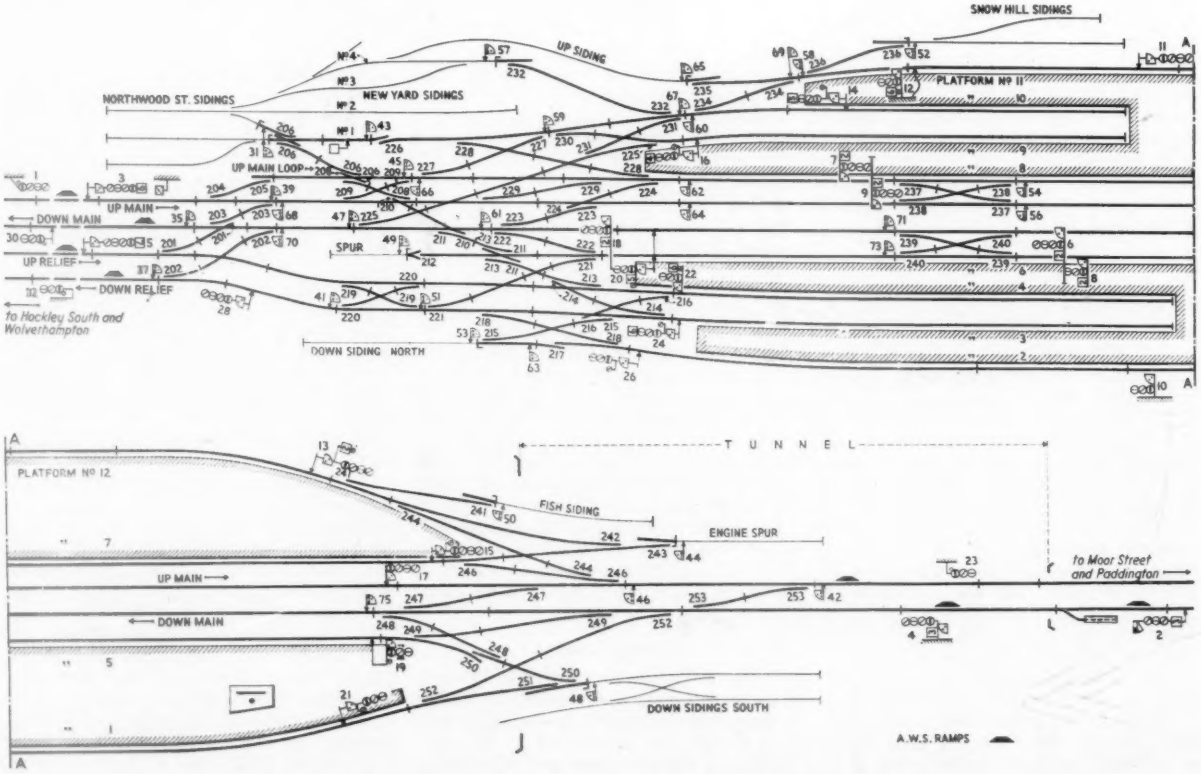
At the north end of the station there is room for four bay platforms, two on each side. These cater for local services, but at the south end, where the station is in deep cutting, there are no bays. Local trains have to start from the through line platforms, nos. 1, 5, 7, and 12.

There are six lines through the station: the four platform lines already mentioned, and two middle lines, up and down main. The through platforms bear different numbers at the north and south ends, as each is long enough to accommodate two trains. Working is further facilitated by scissors crossings half-way through the station between the up and down main and the adjacent platform lines.

Use of diesel trains and railcars has eased the traffic problem by obviating the need to run engines round trains which terminate or start from Snow Hill. Thus the new mid-day Pullman train arrives from London at 2.5 p.m. at Platform 5 and stands there until it starts on its return run at 2.30. The same absence of engine movements applies to local services, now worked by diesel sets. Yet traffic can be intense, and it includes a certain amount of through goods working.

Colour-Light Signals

Except for certain signals controlled by adjacent boxes, but slotted by Snow Hill, all the running line signals are multi-aspect colour-lights. Most of them show the normal four aspects: red, yellow, double-yellow, and green; but a number of signals, particularly those controlling trains starting from a stand, omit the double-yellow and show only three aspects. All multiple-aspect signals have



Lines and signalling controlled from new signalbox at Birmingham Snow Hill, British Railways, Western Region

12V. 16/24W., tripole lamps, and special deflecting segments are fitted in the lenses to improve the close-up sight given to a driver standing at the signal.

In certain cases a signal will only clear from red to yellow when the train occupies its berth track circuit, and after an automatic time-release has operated. A " delayed yellow " implies that the line is clear only to the running signal next in advance. A more favourable aspect means that at least the overlap beyond the signal in advance is clear. Further reference to this is made in this article.

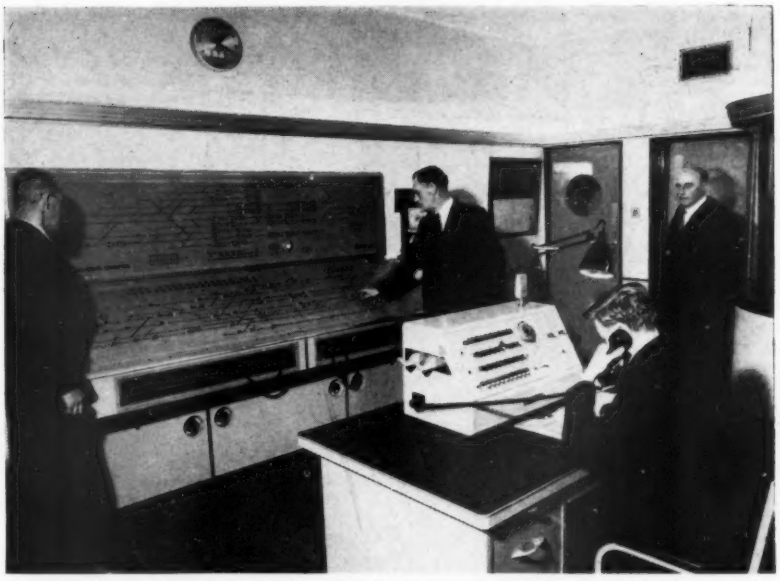
" Theatre " Type Route Indicators

Route indicators are of the " theatre " type. In a few cases they are reinforced by supplementary stencil-type route indicators, when a train can go forward to the next signal by one of two alternative routes. The stencil shows which route the train will take. Thus, if a train is going from the up main to No. 8 platform, it can go *via* No. 204 points reversed or No. 229 points reversed. In both cases the theatre route indicator shows the figure " 8," but in the former case the stencil shows " L" (*via* loop) and in the latter case " M " (*via* main).

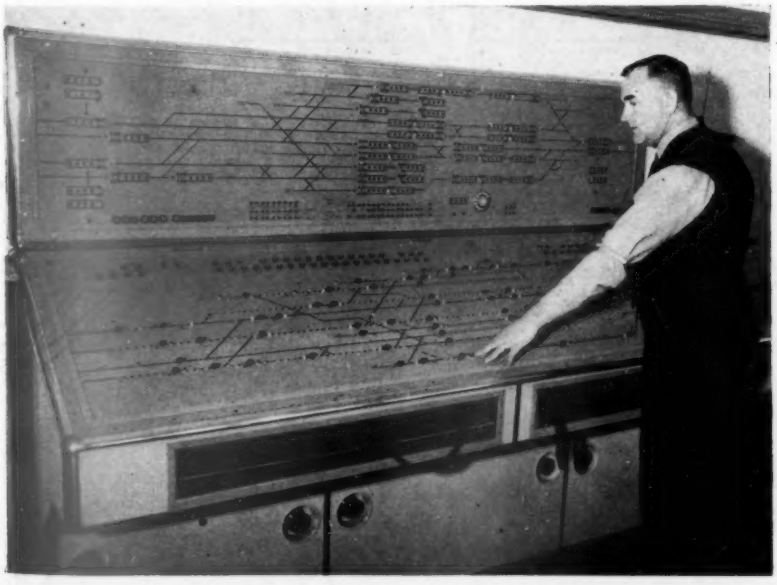
At the London end of the tunnel, the down starting signal for Moor Street is a semaphore signal. It is slotted by Snow Hill, and also carries under it colour-lights which, when the semaphore signal is " off," show yellow, double-yellow or green, in accordance with the aspects of the signals in advance. It also carries a theatre type route indicator, reproducing that on signal No. 4 halfway through the tunnel. The reason for this is that it is important not to check unduly trains on the steep rising gradient through the tunnel, and it has been considered advisable to give an advanced indication of the route to be followed by a train entering the station.

Most running signals have position-light subsidiary signals underneath them for shunt-ahead purposes, which when " off " show two white lights inclined at an angle of 45 deg. When a calling-on indication is needed, this takes the form of a third light, in the right-angle of the subsidiary signal, which when illuminated shows the letter " C." The two white subsidiary lights are also illuminated. If, after a train has been given a calling-on signal into an occupied section, the section becomes clear, the calling-on indication remains. Subsidiary signals only clear when the berth track circuit is occupied.

Signals leading from platforms into sidings take the form of a separate " miniature yellow " signal, adjacent to the running signal. They only exhibit a proceed aspect. Route indications are given for the calling-on and miniature yellow aspects, but not for shunt-ahead movements.



Control and describer panels and telephone concentrator in operating room



Control and describer panels, showing (above) train describer indication units

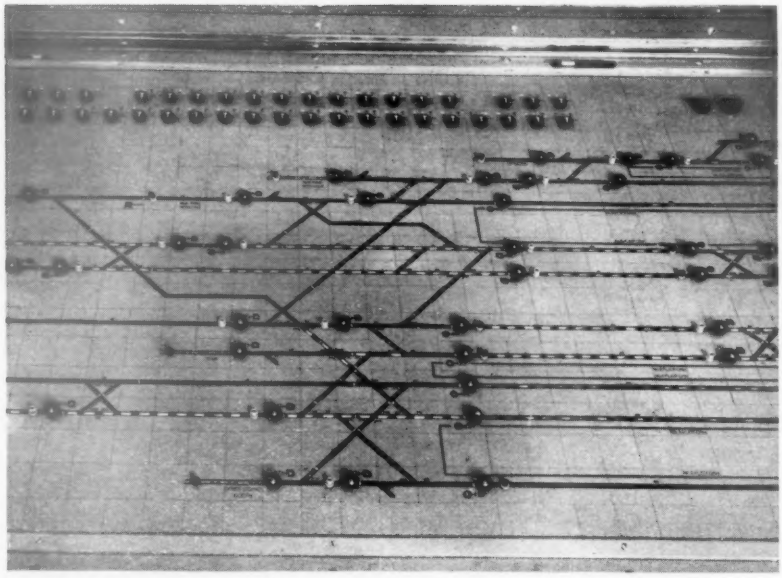
Position-light ground signals give the standard indications: a red and white light, set horizontally when " on," and two white lights at an angle of 45 deg. when " off." They are not equipped with route indicators. Certain ground signals in the facing direction have to be cleared for running movements, and in such cases the setting of the route for the running signal automatically clears all facing ground signals between the running signal in question and the next running signal ahead. These intermediate ground signals are proved to have cleared before the running signal behind them will clear. If, in an emergency, an automatically cleared ground signal has to be restored to danger in face of a train which has already passed the running signal behind it, this is done by restoring the control switch of the running signal to normal and then reversing and restoring the control switch of the ground signal.

Running signals are automatically restored to danger by the occupation of the track-circuit immediately ahead of them. But where propelling movements predominate, subsidiary signals are not replaced to danger until the whole of the train has passed them. Ground signals are normally replaced to danger when the train first occupies and then clears the track circuit immediately ahead of them.

The existing Metropolitan-Vickers G.R.S. 5A point machines have been retained, but their controls have been transferred to the new panel, and their contactors are in the two new relay rooms. There are 50 sets of points, many of which are double ended. In consequence there are 90 point machines.

Control Panel

The control panel is a sloping console, the operating face of which has a green matt finish with the tracks shown in black. It is 8 ft. 4 in. long, and has been laid out for operation by one signalman on the " entrance-exit " or " NX " system. On the track line adjacent to each signal, as shown on the panel, there is a



Section of operating panel, showing NX switches and buttons, emergency point switches, and route indication lights

rotary " entrance " switch, and immediately to the rear of the signal in advance an " exit " push-button. Where the entrance signal in rear controls a route containing no points, the exit button is omitted.

To set up a route and signal a train forward from one signal to the next, the signalman first rotates the entrance switch through an angle of 90 deg., and then presses the appropriate exit button at the end of the route he requires. If the line is clear and no conflicting movement has been set up or is taking place, all the necessary points on the route move as required automatically, and when they are detected in the appropriate position, the signal (and any facing subsidiary signals in advance of it) clears the entrance signal showing an aspect dictated by that displayed by the signal ahead.

On each entrance switch there are one or two arrows : a red arrow, normally pointing upwards, for a running signal ; and a yellow arrow, normally pointing downwards, for a subsidiary signal. When an entrance switch controls both running and subsidiary signals, it has two arrows. To select which type of signal is needed, the switch is rotated so that on the diagram the appropriate arrow, red or yellow, points in the direction of the required move.

The exit buttons are red, or yellow, or red on a yellow base. This depends whether any desired move up to them is governed by a running or subsidiary signal, or by both.

Domino Panel

As stated, the panel is of the " domino " or " mosaic " type. It is divided into small, tight-fitting, separate units, each containing its own section of track line, with any relevant switches, push-buttons, and indication lamps. Each unit is in plug-in form, so that it can be removed without disturbing the underlying wiring.

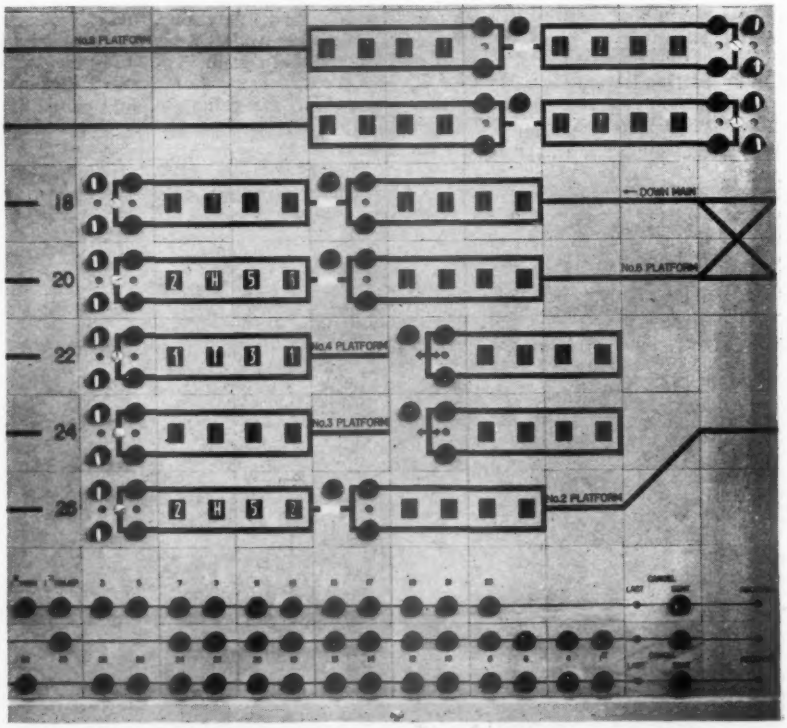
This system of construction has two advantages. First, if any switch, button or lamp needs adjustment or replacement, all that has to be done is to pull out the unit, do the necessary work, and then put the unit back again ; no disconnections are needed, nor is it necessary to go underneath or to the back of the panel. Secondly, if at some future date the layout of the area has to be modified, all that is needed is to replace the units so affected ; there is no need to re-model the whole panel.

The diagram on the panel gives the signalmen all the information which they need. Each signal profile contains repeater lights which show red, when the signal is " on," green when it is " off " (regardless of aspect), or white when a slot is " off." The track lines shown on the diagram contain a series of short rectangular apertures. These show the state of each section of the whole area. There is a white dividing line on the diagram line at the end of each track circuit, and the end of each overlap is marked by a black dot on the dividing line at that point.

Normally these apertures are not illuminated. During the setting-up of a route and while the intervening points are moving, the apertures defining their position show a flashing white light. When the points are detected and locked, all the apertures through the route show steady white lights, and the repeater of the signal, changes from red to green. Again, once the train approaches the governing signal, the route will become approach-locked until either the train has passed the signal, or an automatic time release has had time to take effect. So long as the approach-locking is effective, the white lights are shown.

Overlap Section

If the overlap beyond the signal in advance is clear, the signal in rear will display at least a free yellow aspect. In such a case all trailing points in the overlap will be locked. The position of facing points in the overlap is indicated on the diagram by a single white light in the



Part of train-describer panel, showing control buttons and four-symbol train indication units

track line aperture defining the position of these points. Facing points in the overlap become route-locked on the approach of the train to them, with automatic time-releases to enable them to be freed subsequently, after enough time has elapsed to ensure that the train has come to a stand behind the signal protecting them.

If the overlap is fouled by trailing points in it being set in the conflicting position, then a white light appears in the overlap section indicating the position of such points, but the points are not locked by the setting of the route in question. But once a signal has displayed an aspect less restrictive than a delayed yellow, then all trailing points in the overlap are locked.

Use of White Lights

When a train enters a section, the white lights change to red and remain at red until the train has cleared. Approach track circuits outside the area controlled by the panel also have their occupancy indicated by red lights.

Normally, the white lights are extinguished as the train passes through each section, thus showing that the sectional releases to the route locking have taken effect. But if a train stops in a section short of the signal in advance, then the white lights ahead of it (and including the overlap) will continue to show until the appropriate time releases have taken effect.

The white lights on the diagram give further indications:

(1) When a signalman in an adjacent box clears the slot on either of signals 23, 30, or 32, a white light with an arrow pointing in the direction of the train shows on the extreme edge of the diagram;

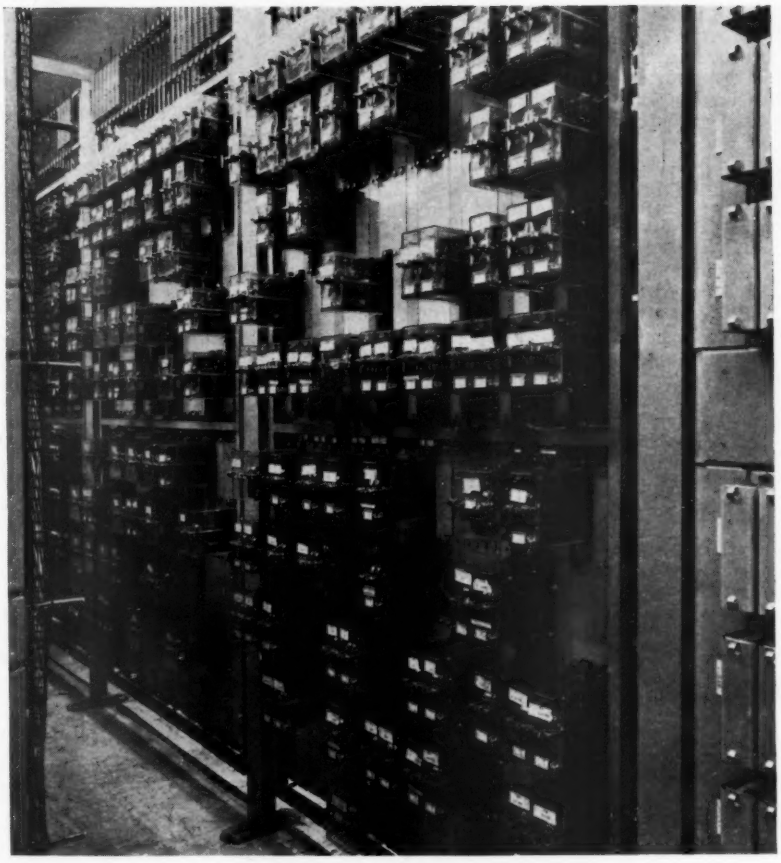
(2) Moves into sidings require a release from the shunter's plunger; this release is indicated by a white light at the end of the siding, as shown on the diagram;

(3) If a signalman fails to replace an entrance switch to normal after a train has passed a signal, then a flashing white light appears in the aperture on the diagram adjacent to the signal, to warn him that the signal will not clear again until the route has been cancelled and reset up.

Point Switches

Along the top of the console are the emergency block bell keys to adjacent boxes, and also the individual point switches, one for each set of points. The point switches have three positions, "N," "C" and "R." Normally they are in the "C" position, and then the points are free to be moved by the setting up of routes. To move a particular pair of points independently of route setting control, the point switch is rotated to the "N" or "R" position, as required.

Above each switch there are two white lights, showing "N" or "R" respectively. There is also a red "lock" light. When this is illuminated, the points are locked, either because their protecting track circuit is occupied or because a route over them has been set up or because they are approach or route locked.



Interior of South Relay Room

"Train ready to start" indications are given by the platform staff. They appear on the diagram in the form of a small flashing blue light at the end of each platform. This light continues to flash until the relevant signal is cleared, or until it is cancelled by the signalman.

In one corner of the panel are lights giving miscellaneous indications, such as failure of the power supply to track circuits, and point faults, etc. There is also a switch to illuminate all point indication apertures on the diagram, regardless of whether or not a route has been set up; this facility being provided basically for hand signalling purposes. A dimming switch controlling all ground signal aspects is provided to be used during hours of darkness to avoid unnecessary glare to drivers. There is also a switch for dimming the panel indication lamps.

Train Describers

The train describers operate from a second vertical panel, immediately above and behind the console. The salient feature of this panel is a second track diagram in a simplified form.

The train descriptions follow the standard Western Region pattern. Each description consists of a group of four symbols. An example is "5A72." The initial figure denotes the class of train and the letter its district of destination. The two final figures identify the train.

On the diagram, adjacent to each signal, is a unit consisting of four stencil indicators in which the description of the train can appear. There are also units in each bay platform, and further units at each end of the diagram, in which the description of approaching trains appear when these are transmitted from the adjacent signalbox, Moor Street or Hockley South.

Once a description has appeared on the diagram, it is automatically transmitted forward from unit to unit, as the train moves through the area. Opposite each unit are two black push-buttons, and at the bottom of the panel there is an ordinary telephone dial. To interpose the description of a train at any point, its group of symbols is dialled, and then the top button of the appropriate unit is pressed. The bottom button is used for cancelling.

Additional units are provided for permissive signal sections where several running movements may occupy the section simultaneously, with special indication and alarm arrangements should a further train enter a permissive section for which all the display units are occupied.

Signal Post Telephones

Adjacent to each unit there are also two more push-buttons and an indicator light. These are associated with the signal post telephones, 35 of which are in use. The lamp shows when a driver is calling from the signal appertaining to

that particular unit, and the buttons are for "speak" and "cancel" indications. The operator's handset normally rests in a drawer under the console. A second telephone is provided in the drawer connected to the concentrator for use when the signalman wishes to speak to the relay rooms, station staff, and so on.

Along the bottom of the describer panel are push-buttons associated with selected display units, which when depressed transmit the description exhibited in the unit in question forward to the adjacent signalbox.

The concentrator is on a desk a short distance behind the console. It has 20 lines, 15 of which are in use. Lines from it run to the two relay rooms, to the platform inspectors, and to various other points.

"Talk-back" facilities at loudspeaker volume are also provided independently between the operating room and the two relay rooms, which include switches to permit of three-way conversation. A soundproof enclosure for the train announcer is in a corner of the operating room.

Relay Rooms

There are two relay rooms, north and south. The south relay room is situated above the operating room, while the north room is alongside the former north signalbox over the lines a short distance beyond the ends of the platforms. This overhead construction has been adopted because of the limited space available in the north area of the lay-out, the lines being carried on arches at this point. All the relays and contactors relevant to the north end of the station are located in this relay room, with remote control from the operating room, and remote indication to it. These controls and indications are transmitted over 150-pair air-spaced cables. The controls and indications are received by P.O. 3000 type relays of which 1,840 are used, in plug-in units of five relays each.

There are 1,686 signalling relays, also of the plug-in type, used in the installation, which are mounted on racks in the relay room. They include 121 time element relays, of which 97 are of the thermal type.

Track Circuits

There are 81 track circuits in the area, and with one exception they are of the capacitor-feed type. The exception is the down line through the tunnel from Moor Street. This has a coded track circuit, to make certain that it functions properly under the low ballast resistance conditions existing in the tunnel.

The main signalling cables are of the multi-core impregnated paper-insulated lead-sheathed type to Western Region Signal Department specifications. The subsidiary cables for external connections are single core for the leads to rails and multi-core to the point machines and signals. Both are to British Railways Specification No. 972.

Relay rack wiring makes use of 1/044 copper conductors, P.V.C. insulated, to Western Region Signal Department specification. For inter-rack wiring, multi-core cables, ranging from five to 40 cores each, are used. Air-conditioning plant is provided for the operating room and each relay room.

Power Equipment

The power equipment is located in arches beneath the station. The main supply is at present taken from the Local Authority at 400 V., 50 cycles. The existing 20-kVA. stand-by diesel plant has manual start and change-over.

It is proposed to instal a new main supply at 415 V. 50 cycles, with a 50-kVA. diesel stand-by set. The latter will come into use automatically on the failure of the main supply, and will incorporate synchronising facilities for changing from the normal supply to the stand-by supply, and vice versa, without interruption.

In each relay room are two 15-kVA. transformers, one working and one stand-by, to reduce the voltage to 110 V. for general signalling purposes. Each relay room also contains two 50-V. d.c. rectifiers for the P.O. type remote control relays, and two 12-V. d.c. rectifiers, one of each kind being working and one stand-by. The power supply to the train describer consists of a floating 24-cell lead acid battery of 10-AL. capacity charged by a constant voltage charger. A 50-V. rectifier is also provided to permit polarity coding of signals between adjacent boxes.

Ancillary Equipment

In the south relay room a standard 24-V. 40-AL. trickle-charged battery, with centre earth, is installed for telephone ringing and the emergency block bells. For panel indications in the operating room, there are two 110/24-V. 2-kVA. transformers (one working and one spare) with secondary tappings for "panel dimming." For operating the point machines, the existing 110-V. 240-AL. lead acid cell battery is used.

The whole of the circuit design of the signalling and train describer equipment, the mechanical design of relay racks, relay room layouts and so on, and the general work of installation, were carried out by the staff of the Signal Department of the Western Region to the requirements of Mr. A. A. Cardani, Signal Engineer.

The following contractors and suppliers were employed:—

Signalling and train describer panels ...	Henry Williams Limited
Signalling relays ...	Associated Electrical Industries—G.R.S. Limited
P.O. type relays, relay racks, and telephone concentrator ...	M.L. Engineers (Plymouth) Limited
Racks for signalling relays	Westinghouse Brake & Signal Co. Ltd.
Train describer racks, rack equipment, and wiring	Associated Electrical Industries (Woolwich) Limited
Air-conditioning plant in south relay room ...	Birmingham & Blackburn Constructions Limited
Air-conditioning plant in north relay room ...	Wetherfoil Limited

Stratford Diesel-Locomotive Maintenance Depot

(*Concluded from page* 509)

vided for the fuel oil to be delivered to Stratford by either rail or road tankers.

Two types of lubricating oil, compressed air, radiator cooling water, and both hard and soft water are all services piped to the shed for connecting direct to the locomotives. Supplementary oil-storage tanks in the basement can be connected in multiple to the dispensing pumps. At each berth a pre-setting meter allows only the exact amount of oil required to be taken. Self-winding hose reels house 25 ft. of 1½-in. hose terminating in a 1½-in. self-sealing coupling. Engines in all British Railways main-line diesel locomotives have a filling/drain connection at solebar level which is therefore accessible from below the depot platforms.

To dispose of contaminated sump oil a waste-oil pipe line has also been provided. With the aid of a mobile compressed-air-operated pump all the oil can be evacuated from the sump and pumped to the storage tanks adjacent to the boiler-house where the waste oil can be used as boiler fuel. Air compressors are situated in a portion of the boiler-house.

Cooling Water Supplies

Engine coolant is mixed in a 250-gal. tank in the basement; the mixture consists of 1 per cent emulsion of soluble oil which is fed to a 2,500-gal. storage tank on the upper floor.

Arrangements are in hand for the erection of a washing plant for locomotives in addition to the one already installed for multiple-unit stock. A sanding plant is also planned, with distribution from overhead hoppers. Final stages of the scheme include the demolition of the remainder of the Jubilee shed and the removal of the coaling plant, turntable, and redundant tracks.

Development and execution of the scheme was directed by Mr. A. K. Terris, Chief Civil Engineer, British Railways, Eastern Region, in whose office the permanent way layout was designed. Messrs. C. H. Dobbie & Partners acted as consulting engineers with responsibility for the design of the shed and other works as well as for site supervision. The messrooms, stores, boiler house, and ancillary buildings were the responsibility of Mr. H. H. Powell, Architect to the Eastern Region. Mr. T. C. B. Miller, Chief Mechanical & Electrical Engineer, Eastern Region, was responsible for the design and installation of lighting, heating, and all services as well as equipment for the depot. Permanent way alterations and the installation of pipework and equipment were carried out by staff of the Region.

Contractors included:—

Main contractors for construction work	Higgs & Hill Limited
Demolition work	W. & C. French Limited
Piling	Cementation Co. Ltd.
Precast frames	Concrete Development Co. Ltd.
Electrical installation ...	Drake & Gorham (Contractors) Limited
Heating installation ...	Brightside Heating & Engineering Co. Ltd.

RAILWAY NEWS SECTION

PERSONAL

Mr. G. K. B. de Graft-Johnson, Deputy General Manager, Ghana Railway & Harbours, has been appointed General Manager.

Mr. Ratan Lall, Director, Traffic (Transportation), Indian Railway Board, who, as recorded in our September 9 issue, has been appointed General Manager, North-East Frontier Railway of India, passed with honours as a Civil Engineer from the Thomson Civil Engineering College, Roorkee, in 1930, and joined the former East Indian Railway as probationary Assistant Traffic Superintendent in 1931. He worked on the Howrah, Assansol, Moradabad, Lucknow and Allahabad Divisions, and became Deputy Chief Operating Superintendent (Goods), East Indian Railway, in 1948. In 1952 he became Officer on Special Duty for the integration of the former East Indian and Bengal–Nagpur Railways, and was later appointed as the first Regional Traffic Superintendent of the Bilaspur Region. Mr. Lall was a member of the Pilot & Depot Capacities Committees in 1954–55, and railway expert for the Indian delegation which negotiated with a Russian delegation for the establishment of the Bhilai Steel Plant in October–November, 1954. He moved to the Southern Railway in November, 1955, as Chief Operating Superintendent, and two years later he was transferred to the Railway Board as Director Traffic (Transportation), the appointment which he has now relinquished.

Mr. Ratan Lall
Appointed General Manager, North-East Frontier Railway of India

Mr. Jagjit Singh
Appointed Director, Traffic (Transportation), Indian Railway Board

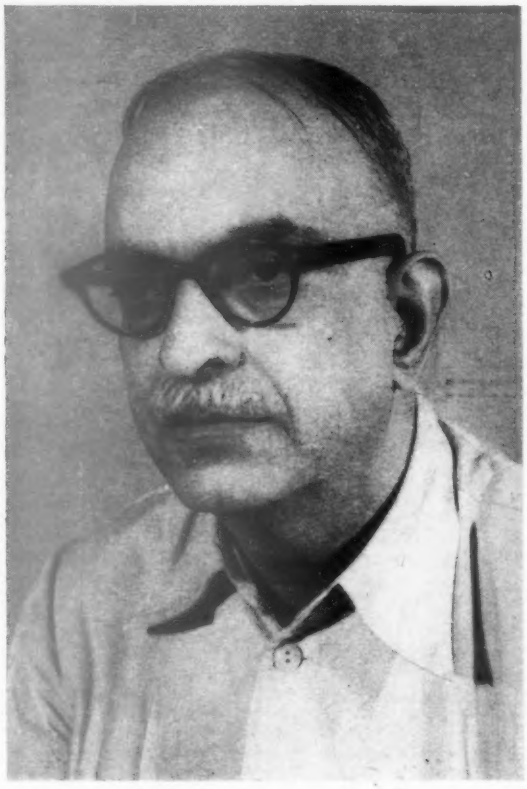
We regret to record the death of Sir Charles Marr, formerly Australian Minister of Works & Railways from 1932 to 1934, and a Director of Hadfields Steel Limited (Sydney).

The following redesignations of Canadian Pacific Railway senior executive titles have been announced by Mr. A. H. Hart, Vice-President, Sales; there is no change in the functions of the officers concerned: Mr. E. A. Ryder, Deputy Vice-President, to be Deputy Vice-President, Sales; Mr. G. R. Johnston, General Freight Traffic Manager, to be General Sales Manager, Freight; Mr. C. E. Dobson, Assistant Freight Traffic Manager (Rates), to be Manager, Freight Rates; Mr. H. W. Craig, Traffic Manager, Foreign Freight, to be Manager, Foreign Freight, Sales. In the department of passenger sales, Mr. Pierre, Delagrave, General Passenger Traffic Manager, is to be General Sales Manager, Passenger; Mr. P. G. Edwards is to be Manager, Passenger Sales; Mr. W. G. Hinkel is to be Manager, Passenger Promotion; and Mr. J. N. Vincent is to be Manager, Passenger Train Services.

Mr. Jagjit Singh, Chief Operating Superintendent, Western Railway of India, who, as recorded in our September 16 issue, has been appointed Director Traffic (Transportation), Indian Railway Board, joined railway service on the former Eastern Indian Railway in 1936. He was promoted to the Senior Scale in 1943, and worked in the Headquarters as well as the various Divisional offices of the Eastern Indian Railway until May, 1952. He was then appointed Deputy Director of Rail Movements, Moghalsarai, and solved the Moghalsarai "bottleneck" problem. In June, 1953, he was promoted to Junior Administrative rank, and worked on the former Eastern Railway. Three years later, he was transferred to the Railway Board as Director, Efficiency Bureau, in which capacity he accompanied the then Member (Transportation) Railway Board (Mr. K. B. Mathur), on his World Bank Mission to Washington. On returning he was one of three senior officers deputed to conduct the Slater Mission sent by the World Bank to tour the Indian Railways in February, 1957. In October, 1957, he was promoted to the Intermediate grade, and appointed Regional Superintendent, Bilaspur, South Eastern Railway. In July, 1959, Mr. Jagjit Singh became Chief Operating Superintendent, Western Railway, the position which he has now vacated.

Mr. G. P. Shahani, formerly General Manager, South Eastern Railway of India, who, as recorded in our July 15 issue, has been appointed General Manager Chittaranjan Locomotive Works, was born in 1906. He joined the former North Western Railway as Assistant Executive Engineer in 1931, and served on that railway until partition, except for two years during the war, when he was transferred to the Bengal Assam Railway on construction schemes. On partition in 1947, he was posted to the newly-formed East Punjab Railway, which is now part of the Northern Railway. In

1947 he dealt with the movement of a very large number of refugees then moving between India and West Pakistan, in addition to heavy floods which at one time completely disrupted all rail communications, seriously hampering the movement of the refugees. In May, 1948, he was transferred to the Assam Rail Link Project as Deputy Chief Engineer and remained there for three years. He subsequently returned to the East Punjab Railway, in charge of the Mukerian-Pathankot line construction. He became a member of the Railway Board in May, 1954, as Joint Director (Civil Engineering), and was appointed Engineer-in-Chief of the Ganga Bridge Project in November the same year. During his two years in this office, all the river training works, including the closure of the North Channel, were completed. Mr. Shahani was appointed Director (Civil Engineering), Railway Board, in 1956, and a few months later became Director, Railway Planning. In 1958 he was appointed to the position he has vacated.



Mr. G. P. Shahani
Appointed General Manager, Chittaranjan Locomotive Works, India

The late Mr. E. Casey
General Manager, New Zealand Government Railways, 1940-44

Mr. C. T. Henfrey, Chief Engineer of East African Railways & Harbours, is retiring at the end of October, and Mr. J. M. Kesson, Assistant Chief Engineer (Technical), has been appointed Acting Chief Engineer.

Mr. M. G. Maycock, Chief Civil Engineer, Scottish Region, has been appointed Principal, British Railways School of Transport, Derby.

Mr. H. G. Smith, Principal Scientific Officer, British Scientific Research Association, has been appointed Principal Scientific Officer, British Railways Central Staff, Electrical Engineering Department.

Mr. R. Moorhouse, Traffic Costing Officer, British Transport Commission Headquarters, has been appointed Assistant Treasurer, British Railways, Eastern Region.

Mr. P. Rees, Organisation & Methods Assistant, Chief Civil Engineer's Department, British Railways, Western Region, has been appointed District Engineer, Shrewsbury.

Mr. G. Coaker, Commercial Superintendent (Great Eastern), Liverpool Street, Eastern Region, has been appointed Movement Superintendent (Great Eastern). He is succeeded by Mr. R. A. Long, formerly Economic Survey Officer to the Region.

Mr. C. Birch, District Superintendent, York, has been appointed Assistant Operating Officer, North Eastern Region, York.

LONDON MIDLAND REGION APPOINTMENTS

The following appointments have been announced by British Railways, London Midland Region: Mr. T. P. Stafford to be Divisional Traffic Manager, Manchester; Mr. W. O. Reynolds to be Divisional Traffic Manager, London (Midland Lines); Mr. J. H. M. True to be Divisional Traffic Manager, London (Western Lines); Mr. H. A. Mugliston to be Divisional Traffic Manager, Liverpool.

Mr. E. Casey, A.M.Inst.C.E., former General Manager of the New Zealand Government Railways, whose death was recorded in our October 14 issue, was born in London in 1885, and accompanied his parents to New Zealand in 1896. He was educated at the Marist Brothers' School, Napier, and later at Auckland University. He joined the New Zealand Government Railways Department as a cadet in the Civil Engineering Branch in November, 1902, and subsequently served in the Wanganui, Auckland, Greymouth, and Ohakune districts. In 1912 he took over the duties of Assistant Engineer, Auckland District, and in 1916 took charge of the grade easement works between Penrose and Mercer. In 1921 he was transferred to the Christchurch District, and was engaged in remodelling the station yards on the Midland line prior to the opening of the Otira tunnel. When it was decided to proceed with the new station at Auckland, and the Auckland—Westfield new railway, Mr. Casey was selected to take charge of that work. In March, 1925 he was appointed Inspecting Engineer for the New Zealand Railways with headquarters at Wellington, and in 1926 was transferred to Auckland as Divisional Superintendent of the North Island. In 1931, he became Chief Engineer of Railways, in 1933, Assistant General Manager, and in 1940, General Manager. He retired in 1944.

Mr. H. F. Sanderson, Assistant Commercial Officer, British Railways, North Eastern Region, retires today.

Mr. H. E. Cox, M.I.R.S.E., formerly Deputy Chief Engineer (Signals), Great Indian Peninsula Railway, whose death was recorded in our October 21 issue, joined the Great Western Railway in 1910 as a premium pupil of Mr. A. T. Blackall, then Signal Engineer. He entered the service of the Great Indian Peninsula Railway in 1915 as an Assistant Signal Engineer, and was appointed Chief Assistant in 1921. While on leave in England in that year he was placed on

The late Mr. H. E. Cox
Deputy Chief Engineer (Signals), Great Indian Peninsula Railway, 1935-47

The late Mr. Percy Nunn
Formerly District Traffic Superintendent, Orpington, Southern Region

The late Mr. F. Lockwood
London Cartage Manager, Eastern Region, Kings Cross, 1943-53

special duty to report to the London board of the then company on automatic train control. During 1926-30 he was Assistant-in-Charge of the power signalling construction works in the Bombay suburban area, which included the installation of automatic signalling and colour-light signals, opened in 1928. In 1935 he was appointed Deputy Chief Engineer (Signals). Mr. Cox was a frequent contributor to the Indian Railway Board's *Quarterly Technical Bulletin*, and in 1940 he presented a paper before the Institution of Railway Signal Engineers describing in detail the development of signalling on the G.I.P.R. In January, 1942, he brought into service the first installation of double wire interlocking on his railway, which was followed by several other installations. He was Chairman of the Railway Board's Signalling & Interlocking Standards Committee from 1935 to 1947. He also served for three yearly terms as Chairman of the Signal Engineers' Committee, Indian Railway Conference Association, and on several committees dealing with the revision of the Indian railways general rules. In 1946-47 he was a member of a committee reporting on automatic train control. He was a member of the Signal Section, Association of American Railroads (formerly Railway Signal Association), for over 33 years. He resigned from the position of Deputy Chief Engineer (Signals) in 1947.

Mr. A. Jessop, Acting Assistant Commercial Officer, British Railways, London Midland Region, has been seconded to the Government of Mauritius as Transport Consultant.

Mr. G. P. Stuart Clark, M.Inst.T., Superintendent (Indoor—Central Road Services), London Transport Executive, who is retiring on October 29, was educated at Dulwich College and King's College, London University. He served as an apprentice with the Daimler Co. Ltd., Coventry, until he joined the Army in 1914, and was commissioned in the Army Service Corps (Mechanical Transport). After demobilisation he became a Mechanical Assistant in training with the London General Omnibus Company and was made a Divisional Inspector in 1921. In 1925, when the L.G.O.C. adopted a Divisional organisation he was appointed one of the first three Divisional Superintendents and was put in charge of the Southern Division. He was made an Officer of the L.G.O.C. in 1932 and, after the formation of the London Passenger Transport Board a year later, he was attached to the Operating Manager (Central Buses) for liaison duties. In 1939 he was appointed Indoor Superintendent (Central Buses). During the 1939-45 war he rejoined the Army in 1940 and was commissioned in the R.A.S.C. On his return to London Transport he again took up his previous appointment, and was subsequently re-titled Superintendent (Indoor—Central Road Services) in 1950.

We regret to record the death of Mr. Percy Nunn, O.B.E., formerly District Traffic Superintendent, Orpington, Southern Region. He joined the former London Brighton & South Coast Railway as a clerk in March, 1900. In 1910 he went to the Office of the Superintendent of the Line and on the amalgamation of the railways in 1923 was appointed Assistant Divisional Commercial Manager in the London West Division. He became Assistant Divisional Superintendent, London West, in 1930. and was appointed Western Divisional Superintendent, Exeter, in 1934. Two years later he became Divisional Superintendent, London East Division, Orpington. His position was redesignated District Traffic Superintendent, Orpington, early in 1951, and in April of that year he retired. Mr. Nunn was awarded the O.B.E. in 1946.

The funeral service was held at Hayes Parish Church on October 19 and, in addition to family mourners, the following members of the Southern Region staff, active and retired, were among those present: Mr. H. E. Barber, District Traffic Superintendent, London (Western), Mr. T. R. V. Bolland, Line Traffic Manager, S. E. Divison, Mr. N. L. Collins, formerly Trains Assistant, Mr. W. C. Collins, District Traffic Superintendent, London (Central), Mr. A. D. Cook, formerly Treasurer, Mr. A. Earle Edwards, Assistant to Operating Officer, Mr. W. H. F. Mepsted, formerly Chief Development Officer, Mr. W. H. Scutt, formerly District Traffic Superintendent, Southampton, Mr. H. C. Walter, Passenger Assistant to Commercial Officer, also representing Mr. F. P. B. Taylor, General Assistant, Mr. P. A. White, Assistant General Manager (Traffic), and Mr. F. J. Wymer, formerly Assistant General Manager.

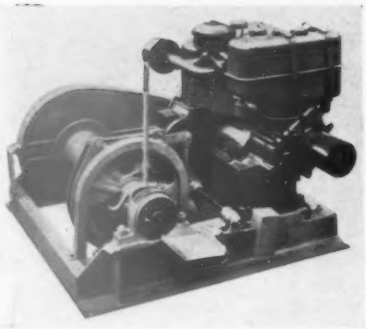
Mr. F. Lockwood, former London Cartage Manager, Eastern Region, Kings Cross, whose death was recorded in our October 21 issue, was educated at Watford Grammar School, and entered the service of the Great Northern Railway in the Goods Accounts Office at Kings Cross in 1903. He was transferred to the Mineral Agent's Office at Kings Cross in 1908, and was appointed to the District Goods Manager's Office, Nottingham, in 1912. In 1915 he was transferred to the London Cartage Committee at Kings Cross where he remained until 1925, when he was appointed Chief Clerk in the Horse Superintendent's Department at Leeds. He became Assistant to the London Cartage Manager, Kings Cross, in 1928, and in 1930 was appointed Chief Clerk to the Cartage Manager, Southern Area, L.N.E.R. He was Acting Assistant Cartage Manager, Southern Area, L.N.E.R., from 1940 to 1943, when he was appointed London Cartage Manager, L.N.E.R. He continued in this appointment after 1948 until his retirement in April, 1953. Mr. Lockwood was Chairman of the Inter-Regional Committee for Cross Town Cartage of Parcels & Goods Traffic, Member of the Sub-Committee for the Co-ordination of Railway Facilities in London, Member of the London Council & Awards Committee of the Royal Society for the Prevention of Accidents. As London Cartage Manager, he was responsible for 750 vehicles moving 1,000,000 tons of freight and 15,000,000 parcels a year.

Mr. J. R. Garwood, Divisional Superintendent (Central Road Services), South East Division, London Transport Executive, retires on October 29.

London Transport Executive Appointments

The London Transport Executive has announced the appointment of the following Divisional Superintendents: Mr. A. E. Flack, Divisional Superintendent, Central Road Services, N.W. Division, as Divisional Superintendent, West Division; Mr. M. J. McCoy, Divisional Superintendent, Central Road Services, N.E. Division, as Divisional Superintendent, East Division; Mr. F. J. Lloyd, Divisional Superintendent, Central Road Services, S.W. Division, as Divisional Superintendent, South Division. Reference to modification of the Central Road Services organisation is made on page 523.

NEW EQUIPMENT AND PROCESSES



General-Purpose Winch

THE Sykes No. 3 10-cwt. power-driven winch is a small general-purpose unit suitable for haulage duties in factories and railway yards. In addition it is capable of operating an 8-cwt. drop hammer at 120 ft. per min.

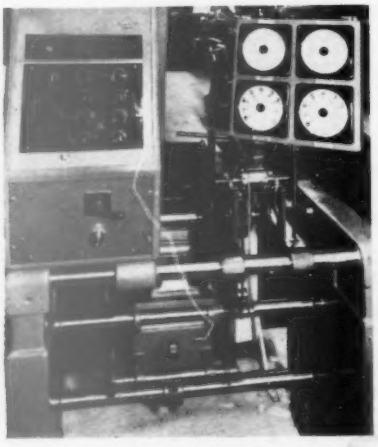
The cast-iron drum is carried on ball and roller bearings in grease-tight housings and is operated through a Jackson friction clutch. The drive from the engine is by duplex chain enclosed in a chain case. Sensitive control to give accurate positioning of loads is provided by an external contracting type footbrake used in conjunction with the clutch. A speed control may also be fitted.

Power is from either a diesel engine, as illustrated, or a petrol engine. The diesel engine is the Lister SL2 twin-cylinder air-cooled type, developing 5¾ h.p. at 1,200 r.p.m., and fitted with a 3: 1 reduction gearbox. The petrol engine is the J.A.P. 5B single-cylinder engine developing 5 b.h.p. at 1,800 r.p.m. and fitted with a 4:1 reduction gearbox.

Further details may be obtained from Henry Sykes Limited, 53b, Southwark Street, London, S.E.1.

Memory Device for Balancing Machines

GISHOLT DYNETRIC Type "S" balancing machines for examining rotating parts such as electric-motor armatures, pulleys and flywheels, can be fitted with additional equipment to hold or memorise out-of-balance readings until the necessary corrections have been applied. By this means, it is claimed that an additional safeguard is provided against errors of the operator and that the whole balancing procedure is speeded up.



Vibrations caused by the unbalance of the machine under test are transmitted mechanically to pick-up coils located in the field of powerful permanent magnets. The motion of the coils in this field generates an alternating voltage in the coils proportional to the amplitude of the vibration, thus allowing the amount of correction required to be indicated. The positions of the peaks in the alternating voltage indicate the angular position of the correction to be applied. This angle is indicated on a dial for each correction plane on balancing machines equipped with holding meters, otherwise by a stroboscopic lamp illuminating a scale of numbers attached round the work, the lamp flashes being actuated by the peaks of the pick-up coil voltage.

The amount of correction is shown on a meter in arbitrary units which may be selected by calibration switches to facilitate correction. Corrections indicated for one plane are unaffected by any unbalance in the other plane; thus trial-and-error correction is eliminated.

Further details of this equipment, as well as particulars of the full range of Gisholt Dynetric Type "S" balancing machine, may be obtained from the Gisholt Machine Co. (Great Britain) Ltd., 161a, Central Road, Worcester Park, Surrey.

Crane Skip

THE Thwaites crane skip can be interchanged with a standard small dumper skip by means of a simple attachment which does not require nuts or bolts. It is used in conjunction with a fabricated steel stand which enables an empty skip to be deposited by the crane without waiting for the dumper to return to the crane base. Thus more than one skip can be used with each dumper.

When secure on the dumper the skip does not reduce the driver's forward view or interfere with weight distribution. An opening side allows a stiff concrete mix to enter easily and, as shown in the illustration, the rate of discharge is under control by the placer at all times. Bottom discharge can be provided for without additional cost.

Two sizes of skip are available with capacities of 12 and 16 cu. ft. They are priced at £45 and £57 respectively including delivery. The stands cost £26 10s. and £35 respectively, and the locking catch for attachment to the dumper, £2 and £3 respectively.

Further details may be obtained from the Manufacturer, the Thwaites Engineering Co. Ltd., Cubbington, near Leamington, Warks.

Mobile Lift

THE Mobiliftor self-propelled mobile lift enables a man to hoist himself to a height of 25 ft. in a few seconds and to retain control of forward, backward, and turning movements for bridge inspection and many similar kinds of work normally requiring ladders and scaffolding. Thus, much of the work needed in difficult locations which required two men can be performed single-handed and with reduced risk from injuries caused by falling.

Power for all movements of the Mobiliftor is from a single-cylinder petrol engine which drives an air compressor to raise the platform pneumatically. For quick movement from one site to another the lift can be towed behind another vehicle. It is claimed that the controls are simple to handle and that running and maintenance costs are extremely low. The speed and manoeuvrability afforded should reduce man-hours also on the cleaning of lighting fittings, inspection and maintenance in buildings, on some aspects of the erection of telephone and power lines, also on sign painting and bill posting.

Further details may be obtained from the Thames Packaging Equipment Company, 28, City Road, London, E.C.1.

Lubricant Additive

RECENT comparative tests carried out by the Institute Francais du Petrole using radio-active tracer techniques to give direct information regarding the rate of wear on piston rings have shown that, with the addition of 6 per cent of Rocol Molyspeed molybdenum disulphide to the high-grade supplement-1 oil in a Petter AV1 5-b.h.p. stationary diesel engine, the rate of wear was reduced by 57 per cent by weight.

Further details may be obtained from Rocol Limited, Rocol House, Swillington, Yorks.

Retired Railway Officers' Society Luncheon

Mr. K. W. C. Grand on railways' need for quietude in which to implement plans

The annual autumn luncheon of the Retired Railway Officers' Society was held at the Hotel Russell, London, W.C.1, on October 25. Mr. L. W. Conibear the President, was in the chair.

Mr. Conibear, after the Loyal Toast, welcomed the guests. He expressed pleasure at the presence of Mr. K. W. C. Grand, President of the Institute of Transport and Member of the British Transport Commission, and of the other guests who included senior officers, past and present, of the former railway companies, the British Transport Commission, British Railways, and London Transport Executive. He regretted the absence through illness, from which he was recovering, of Sir William Stanier. He then proposed the toast of the guests.

Mr. Grand, replying, said railway officers now retired had given wonderful service to the former railway companies, to the former Railway Executive, to the British Transport Commission, and to British Railways. The railways, he added, needed a period of quiet in which they could carry out their programmes for improvement.

Mr. A. B. B. Valentine, Chairman of London Transport Executive, proposing the toast of the Society, regretted he could say little as to supplementation of railway pensions. In the present state of its finances the B.T.C. could not find money for an object which was not an obligation, though it had the greatest sympathy for it. Proposals had been put to the Government, and were being pressed by the B.T.C. The inquiries into the railways, he suggested, might pave the way for a financial reconstruction which would enable British Railways to keep "out of the red".

Sir John Elliot, a former Chief Regional Manager of the Southern and London Midland Regions, and later Chairman of the Railway Executive and Chairman of L.T.E., replied.

Mr. W. H. F. Mepsted, formerly Chief Development Officer, Southern Region, proposed the health of the President.

Those who intimated their intention to be present were:—

Messrs. B. Adkinson, F. Allwright, E. W. Arkle

Messrs. A. P. J. Ball, G. B. Barton, H. Bastin, W. E. Blakey, M. G. Bennett, A. Bond, R. W. Boorman, L. J. Boucher, W. P. Bradbury, E. W. Bratchell, C. H. Brazier, E. G. Brentnall, Lt.-Colonel P. M. Brooke-Hitching, Mr. H. J. Burcham

Messrs. C. F. Cade, H. F. Caines, I. M. Campbell, W. B. Carter, A. L. Castleman, T. E. Chrimes, J. W. Christopher, L. W. Conibear, A. D. Cook, O. H. Corble, W. B. R. Court, G. E. Curtis, W. C. Cutler

Messrs. J. W. Dedman, R. Dell, E. C. Dewick, H. J. Donovan, P. Drew, J. T. Drinkwater

Sir John Elliot, Sir Ralf Emerson, Messrs. F. D. Y. Faulkner, G. F. Fiennes, A. E. Flaxman, B. P. Fletcher, F. C. Fox, J. H. Fraser

Messrs. W. Gillespie, Sir Eric Gore-Browne, Messrs. A. T. Gosden, K. W. C. Grand, R. A. Green, J. Greenwood, R. O. Griffiths

Messrs. A. E. Hammett, G. J. Harris, A. H. Harrison, E. G. Harrison, S. G. Hearn, G. Hickling, J. Hippisley, R. B. Hoff, C. P. Hopkins, E. Humphries, P. P. Humphrys, E. S. Hunt, A. P. Hunter, G. F. Huskisson

Messrs. T. E. Jackson, B. X. Jessop, A. Johnson, H. C. Johnson, C. L. Jolliffe, A. Jones, J. S. Jones, W. G. Jones, J. W. Kerr, C. F. Klapper

Messrs. E. Lake, G. Lambert, J. H. Laundy, R. L. E. Lawrence, R. Lillico, E. O. Lloyd, T. J. Lynch

Messrs. K. L. Mallory, W. J. Manclark, S. Marchant, A. E. Marriott, W. Marsh, E. W. Mauger, M. G. Maycock, A. H. Measures, W. H. F. Mepsted, L. E. Metcalfe, T. Miller, G. Morton

Messrs. T. Neal, L. H. K. Neil, A. W. Norman, R. A. Norrish, H. F. Pearce, M. Pearson, H. W. Phillips, A. C. B. Pickford, H. D. Poole, W. H. J. Pyne

Sir Allan Quartermaine, Messrs. H. G. Rampling, J. Ratter, H. G. N. Read, W. B. Richards, C. J. Rider, J. Rigby, H. E. Roberts, V. A. M. Robertson, C. I. Routh, T. W. Royle

Messrs. M. Y. Sandeman, L. M. Sayers, R. G. Scarsbrook, H. H. Searle, F. H. Sedgwick, A. Shoemack, S. W. Smart, M. G. R. Smith

Messrs. W. M. Stapleton, H. H. Starr, G. Storman, W. A. G. Suddaby, G. Sutcliffe, T. Swan, Maj.-General G. S. Szlumper

Messrs. A. W. Tait, A. K. Terris, J. W. Terry, J. Taylor Thompson, H. C. Towers, A. B. Turner, J. F. H. Tyler

Messrs. A. B. B. Valentine, R. L. Vereker, S. Williams, J. R. Worrall, F. J. Wymer, E. E. Young.

British Railways Campaign Against Litter

About 200 tons of rubbish is removed daily from stations throughout British Railways. Much of it consists of soft drink cartons, empty cigarette packets, fruit peel, and so on. The large staff which sweeps stations up to half-a-dozen times a day and removes litter from vehicles, cannot cope with the stream of waste.

Litter Bins in Coaches

British Railways is launching a campaign to make its own staff, passengers, and others who come on B.T.C. property, more litter conscious. More litter baskets, conspicuously coloured, are being provided at stations, and bins are being fitted in almost all new main-line passenger coaches.

Posters and notices are being issued appealing to passengers to keep trains and stations tidy and to use litter bins. A poster asking railway staff to co-operate in the campaign is going on staff notice boards, and an article in *British Railways Magazine* will feature one of the posters to be used in the campaign. An anti-litter appeal is also being incorporated in railway newspaper excursion advertisements.

Some 50 mechanical platform sweeping machines are already in service on British

Removing litter from concourse at Paddington, Western Region

New poster issued by British Railways

Railways, but an entirely satisfactory machine has not yet been found. Efforts continue to find a machine which will pick up all kinds of litter efficiently, and also sweep. As a mechanical sweeper has to have a clear space in which to operate, it cannot be used on busy crowded platforms where it is most needed.

Carriage cleaning is undertaken by some 9,500 men and women, including about 100 who travel in main-line trains. Some 35 mechanical washing machines and 60 fixed and 290 portable vacuum cleaners are also used for cleaning passenger vehicles. A further 49 washing plants are under construction or planned.

New E.A.R. & H. Films

Sir James Farquharson, General Manager of East African Railways & Harbours, introduced at the British Council Theatre, 6, Hanover Street, London, W.1, on October 24, three 16-mm. films shot in East Africa by the E.A.R. & H. Film Unit and produced in the U.K. by Gateway Film Productions Limited. The films were "E.A.R. & H. Magazine 1959," "East African Industries: Tea," and "A Holiday with a Difference."

New Construction

The seventh edition of the "E.A.R. & H. Magazine" film shows some of the most notable events which took place during 1959. These include the commencement of work on the Bukonte-Jinja line in Uganda and the Kilosa-Mikumi branch line in Tanganyika; progress on the new berths in Mombasa Harbour; and the visit of Queen Elizabeth the Queen Mother, with scenes depicting the Royal train.

"East African Industries: Tea" is the fifth in the series entitled "East Africa's Expanding Industries." It illustrates the development of the tea industry in East Africa and the vital services provided by E.A.R. & H. which form the link between the tea factories and world markets.

The route of the 10-day inclusive tour from Nairobi to Nimule is followed in "A Holiday with a Difference." Travel is depicted by rail, river and road, visiting the Murchison Falls, the National Game Park, and Fola Rapids.

Copies of these and all other films produced by East African Railways & Harbours are available on free loan from either the East African Office, Grand Buildings, Trafalgar Square, London, W.C.2, or from F. C. Pritchard Wood & Partners, Ltd., 197 Knightsbridge, London, S.W.7.

U.K.R.A.S. Entertains CENTO Delegates

Delegates to the Sub-Committee on Communications & Public Works of the Economic Committee of the Central Treaty Organisation (CENTO) were entertained by the United Kingdom Railway Advisory Service, at a cocktail party at the Charing Cross Hotel, London, on October 20.

Guests were received by Brigadier A. E. M. Walter, Head of the International Inland Transport Branch, Ministry of Transport.

Those present included, besides representatives of trade associations.

Ministry of Transport : Mr. Denis O'Neill, Brigadier A. E. M. Walter.

Foreign Office : Sir Ferguson Crawford.

British Transport Commission : Mr. J. Ratter.

Iran : Messrs. N. Gulbenkian, Iranian Embassy ; Eng. H. Samiy ; Eng. Taghi Sarlak, Deputy Minister of Roads ; Eng. Ahmad Afshar, Secretary Directorate General of Roads ; Dr. Jamshid Tavallali, Ministry of Foreign Affairs.

Turkey : Messrs. Nezih Devres, Ministry of Public Works ; Muzaffer Tugal, Ministry of Public Works ; A. Erdinc Karasapan, Ministry of Foreign Affairs ; Hasnu Sabuncuoglu, Turkish Embassy.

Pakistan : Messrs. A. W. Khan, Pakistan High Commission ; El-Haj A. Hamid, Director General, Posts & Telegraphs Department ; Inamullah Khan, Chief Engineer, Building & Roads Department, West Pakistan Government ; T. H. Hashmi, Deputy Consulting Engineer, Ministry o Railways & Communications.

U.S.A. : Messrs. Raymond C. Brisach, U.S.O.M., Ankara ; Norman Snyder, U.S.O.M., Tehran ; John T. Milliken, U.S.O.M., Karachi ; John W. McDonald, Jr., U.S. Economic Co-ordinator for CENTO Affairs ; Berger A. Indseth, Office of the U.S. Economic Co-ordinator for CENTO Affairs ;

Secretariat : Messrs. Bulend N. Kestelli, Deputy Secretary General (Economics) ; Gordon Strong, H. Batmanglidj, S. M. T. Hashmi, and Donald D. Kennedy, U.S. Embassy.

Refresher Course for G.N. Line Controllers

A refresher course for 22 controllers of the Great Northern Line, Eastern Region, British Railways, was held on October 17-21 at the British Transport Commission School of Transport, New Lodge, Windsor. The object was to discuss future and current problems, with special emphasis on safety, and on the increasing part controllers can and must play in improving punctuality and freight transits.

Lectures and Discussions

The course was inaugurated by Mr. G. F. Fiennes, Line Traffic Manager, Great Northern Line. Four lectures were given each day, and time was allowed for questions and discussion after each. The subjects included: "The G.N. Line and Its Future," "Functions of Control," "Safety of the Line," "The Wagon Problem," "Punctuality & Control," "Modern Marshalling Yards," "Modern Signalling and Telecommunications Systems," and "Health & Happiness of Controllers" (by the London Area Medical Officer). The last day was given up to syndicate working.

The 22 students included Mr. H. N. Todd, Deputy Chief Controller, Great Northern Line; and the following Deputy Chief Controllers from districts: Messrs. A. Crosby, Doncaster; S. Mills, Kings Cross; F. Hull and P. Villars, Lincoln; J. Matthewman, Rotherham; A. Leyland and O. Willis, Sheffield, Victoria.

New Railway Offices at Shrewsbury

Plans are being developed by British Railways, Western Region, for new offices to be built in Shrewsbury on a site on the south-east corner of the Chester Street–Cross Street junction.

The blocks as proposed will consist of four floors above the ground floor. The first and second will accommodate the District Traffic Superintendent's staff and will include a new train control office. The third and fourth floors will be used by the District Engineer's and Road Motor Engineer's Departments.

Accommodation on the ground floor, will consist of a car park, bicycle park, entrance hall, and boiler room ; the last will have waterproof walls and doors, because of the risk of flooding. A high-level entrance will also be provided from the station platform.

Construction will involve excavating the existing brick ramp to street level and the building of new retaining walls to support the railway embankment.

Inverted Trough Floor

The structure of the building will be reinforced columns and beams on foundations of bored piles. There will be an inverted trough floor, which will permit a flat ceiling of acoustic tiles with all conduits and wires hidden. A network of telephone conduits will be set into the floor so that any desk can have a telephone without any wires trailing round walls or on floors.

Main east and west elevations will be glazed hroughout their length between white artificial stone mullions at 5-ft. centres, and the spandrel panels will be faced with 2 in. by 2 in. ceramic tiles. North and south elevations will be faced with white Mineralite on a backing of brick with an inner skin of insulating blocks. Windows will be arranged so that they can be cleaned from inside the building and adequate ventilation will be obtained without preventing the efficient use of venetian sun blinds.

The single-storey building on the platform will be of load-bearing brickwork, with a roof similar to the floors on the main block.

The new building should improve the sight lines on the Chester Street–Cross Street as the end bay on the ground floor will be unenclosed.

Staff and Labour Matters

London Busmen

In response to the claim from busmen for improved rates of pay, London Transport Executive last week made an offer of an increase of 18s. a week for London bus drivers and conductors. Discussions on improved working conditions continued on October 24 and subject to final agreement on these, the busmen's committee has recommended the garages to accept the offer.

The improved rates of pay are designed to reduce the acute shortage of bus drivers and conductors and the proposals were considered by a delegate conference on October 26.

L.T.E. was unable to secure agreement to the introduction of an incentive bonus scheme which would have substantially increased the earnings of bus crews.

The increase will apply to busmen on Central, Green Line and country services, present rates being £10 12s. for a Central driver and £10 8s. for a Central conductor. The busmen's last rise was in March, when they received an increase of 10s. a week.

L.T.E. Bus Route Re-numbering.—Fifteen London Transport all-night bus routes were re-numbered when the Central Road Services winter timetables came into operation on October 12. Routes Nos. 284-292 and 294-299 are now N84-N92 and N94-N99, respectively. The object is to release the existing numbers for bus routes to be introduced in replacement of trolleybuses at later stages of the trolleybus conversion scheme.

Contracts and Tenders

Rolling stock for the Hellenic State Railways

The Greek Government has placed orders for 40 bogie passenger coaches in Poland and for 400 refrigerated covered wagons in East Germany, both on a 100 per cent barter basis. This rolling stock is for the Hellenic State Railways.

The order for 342 main-line single-phase 15-kV. 16·6-cycle electric locomotives placed with German industry by the German Federal Railway, as recorded briefly in our issue of September 23, has been divided as follows: Henschel, 114 of the " E.41 " Class and 12 of the " E.40 " Class; Krauss Maffei, 28 of the " E.10 " Class and 83 of the " E.40 " Class; Krupp, 12 of the " E.50 " Class and 93 of the " E.40 " Class. Both the " E.40 " and "E.41" Classes are Bo-Bo, and the " E.50 " Class is Co-Co.

British Transport Docks has ordered a floating grain elevator, capable of handling 300 tons of grain an hour, for King George Dock, Hull. It will be similar to two floating elevators already in use at the dock. The elevator is being provided under the £4,750,000 development scheme now under way at King George Dock, and will be supplied by Simons Handling Engineers Limited of Cheadle Heath, Stockport.

British Railways, London Midland Region, has placed the following contracts:

A. Bagnall & Sons Ltd.: Cleaning and painting at Blackburn Passenger Station

T. A. Ellis & Co. Ltd.: Raising of platforms and ramps at Sawley Junction Station:

Caffin & Co. Ltd.: Reconstruction of superstructure in steel and pre-stressed concrete of bridge No. 173 on the Euston-Rugby line

Whatlings Limited: Unloading and spreading bottom ballast at Carlisle Marshalling Yard

Highways Construction Limited: Resurfacing of platform road between Platforms 3 and 4 at Liverpool Exchange Passenger Station

J. W. Knott (Building Contractors) Limited: Construction of amenities for goods guards at Nottingham Midland Goods Station

T. & E. Warrington (Hyde) Limited: Construction of staff canteen at Manchester Oldham Road Goods Depot.

The Export Services Branch, Board of Trade, has received calls for tenders as follow :—

From South Africa :

18,216 ft. of 46/40 composite trunk cable, underground armoured

2 quads plastic insulated (balanced to 552kc/s.)

5 quads paper insulated (balanced to 252kc/s.)

400 ft. of 8/40 P.I.S.Q. U.G.A. cable

2 cable termination boxes, eight pair for v.f. termination and re-distribution

2 cable termination boxes, 14 pair for termination and re-distribution of carrier frequency circuits

2 cable termination boxes, 32 pair for termination and re-distribution of v.f. circuits

3 loading pots with 32 side coils in each

64 building-out capacitors, rack mounted

10 cast-iron joint boxes and brass sleeves

Numbered and un-numbered paper collets, paper jointing sleeves for 40-lb. conductor wires, multi-core resin solder, silica gel and linen pockets, white linen tape, plumber's metal and paraffin wax, bitumen or similar insulating compound

Acoustic shock absorbers for all v.f. circuits as recommended by tenderer

Gas alarm and fault detection equipment as offered by tenderer with audible and visual alarms at Johannesburg

Cable markers

Pipes, asbestos cement with collars, 4 in. diameter.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed " Tender No. C.8439 : U.G.A. Cable," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. Local representation is essential. The closing date is November 18, 1960. The Board of Trade reference is ESB/27633/60.

From Costa Rica :

250 gauge rods, double jaw adjustable, for 42 in. track.

The issuing authority is La Proveeduria del Ferrocarril Electrico al Pacifico, San Jose, to whom bids should be sent. The tender No. 283. The closing date is November 8, 1960. The Board of Trade reference is ESB/27283/60.

50 tons dog spikes (500 kegs each 200 lb.)

The issuing authority is La Proveeduria del Ferrocarril Electrico al Pacifico, San Jose, to whom bids should be sent. The tender No. 282. The closing date is November 7, 1960. The Board of Trade reference is ESB/27282/60.

From Pakistan:

1 Muller grinder together with suitable motor, complete with control gear, totally enclosed dust and damp proof

1 automatic brick-making press (maker Richard Schefield, Limited, England), together with suitable motor, complete with control gear, totally enclosed dust and damp proof

1 belt conveyor in three sections, each section capable of being driven with independent motors for conveying brickbats from receiving bins to a crusher, and from the crusher to grinders of a sufficiently robust design and construction to withstand continuous operation. The lengths of each section would be about 90 ft., 90 ft., and 45 ft. The width of the belt should be approximately 14 in. with a capacity for handling three to four tons of brickbats and fireclay per hour.

The issuing authority is the Chief Controller of Stores, North Western Railway, Lahore, to whom bids should be sent. The tender No. is 25-S/4-F1 Machinery/P6. Complete set of tender documents can be had from the office of the Chief Controller of Stores, North Western Railway, Empress Road, Lahore. The Board of Trade reference is ESB/27663/60.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

R. E. A.E.R. (Transportation) Annual Dinner.—The Royal Engineers Army Emergency Reserve (Transportation) annual dinner will be held at the Cafe Royal, Regent Street, London, W.1, on February 24, 1961.

The Torshear Bolt.—We regret two conflicting statements in our last week's issue. In the article on the new bridge at Dan-y-Graig it was correctly stated that " the general application of the Torshear principle and the design of the special pneumatic and hand wrenches are the invention of the North Bar Tool Co. Ltd. of Banbury, the makers of the wrenches." In the editorial on the Torshear bolt, the invention was erroneously credited to Mr. W. H. Brodey of that firm.

Netherlands Railways Signal Engineer Visits Permali Works.—Baron van Heemstra, Assistant Signal Engineer, Netherlands Railways, recently visited the works at Gloucester of Permali Limited. The illustration shows him discussing the design of

Baron van Heemstra with Mr. R. I. Douglas at the Permali Limited Works, Gloucester

Sir Roy Welensky, left, and Mr. J. W. S. Pegrum at the opening of Broken Hill Motive Power Depot, Rhodesia Railways

Permali insulating fishplates with Mr. R. I. Douglas, Manager, Railway Division, Permali Limited.

British Road Services Rates Increase.—British Road Services has announced that charges will be adjusted to obtain an overall additional revenue of 10 per cent, with effect from November 1, 1960. The last general increase in rates was made on May 20, 1957.

Rhodesia Railways Motive Power Depot Opened.—Sir Roy Welensky, Prime Minister of the Federation of Rhodesia & Nyasaland, recently opened the Rhodesia Railways new motive power depot at Broken Hill. He performed the opening ceremony by driving a "20A" Class Garratt locomotive through a tape. The illustration shows Sir Roy Welensky with Mr. J. W. S. Pegrum, General Manager, Rhodesia Railways, by the Garratt locomotive shortly after performing the opening ceremony.

Dowty Hydraulic Units Limited at the Public Works & Municipal Services Exhibition.—Dowty Hydraulic Units Limited, a member of the Dowty Group, is exhibiting this year a wide and varied selection of products, at the Public Works & Municipal Services Exhibition at Olympia from November 14 to 19. A complete range of hydraulic gear pumps, gear motors, control valves, self-sealing couplings, and hand pumps will be on show.

Associated Electrical Industries Limited Dividend Policy.—The Board of Associated Electrical Industries Limited has decided to pay future ordinary dividends in two half-yearly instalments; the final each April with an interim in October. The change has been made in response to replies received to a questionnaire sent in July to ordinary shareholders. More than 70 per cent completed and returned the questionnaire and the answers showed that a substantial majority preferred half-yearly payments.

Launch of Eastern Region Ferry Boat.—The first, ml. *Catherine*, of three new vessels for the Tilbury-Gravesend passenger ferry, will be launched at Whites Shipyard, Southampton, on November 4. Mrs. S. A. Claydon, wife of the Continental Traffic & Shipping Manager, Eastern Region, will perform the naming ceremony.

Richmond Bridge Reconstruction Affects Bus Services.—From October 30, when the reconstruction of the railway bridge at Richmond Southern Region station, begins, road traffic will be made one-way north to south over the bridge and through George Street. As a result, all north and eastbound bus and Green Line routes will be diverted away from the area. Southbound services will not be affected. It is expected that the reconstruction will take six months to complete.

Rolling-in of New Metropolitan Line Bridge. The London Transport Executive has announced that, as part of the Metropolitan Line modernisation scheme, the present railway bridge over Marsh Road, north of Pinner Station, will be removed on October 30, and the first of two new longer spans rolled into position. Work on the bridge will start in the early hours of Sunday morning and will go on until 8 p.m. During this time trains will not run between Pinner, Northwood Hills, and Northwood, but these stations will be linked by an emergency bus service instead.

English Steel Corporation Pension Scheme.—The English Steel Corporation group of companies, which employs 14,500 persons in Sheffield, Manchester, and Darlington, including Taylor Bros. and Co., Ltd., of Manchester, and the Darlington Forge Limited, is to introduce a contributory pension and life assurance scheme for its male workpeople. This will provide a life assurance benefit of £500 in the event of a member's death in service and a pension benefit on retirement at age 65 of £3 11s. 6d. a year for each year of membership after April, 1961. A past-service pension benefit of £1 6s. for each year of eligible service before April, 1961, will be granted to those

Opening of Hull Central Goods Station

(*See pages 505 and 506 and editorial comment on page 499*)

Seated (left to right): Sir George Walton, Member, North Eastern Area Board; Mr. A. Dean, Assistant General Manager (Modernisation) N.E. Region; Mr. T. Farrell, Sheriff of Hull; Alderman W. E. Body, Lord Mayor of Hull; Major J. P. Upton, High Sheriff of Yorkshire & Senior Vice-President of the Hull Incorporated Chamber of Commerce & Shipping; Mr. H. A. Short, General Manager, N.E. Region; (standing): Mr. T. H. Summerson, Chairman, N.E. Area Board.

who join the scheme at the outset. The company will bear the greater part of the cost of the future service pension and the entire cost of the past-service pension and life assurance benefit. The employee's contributory payments will be 2s. 6d. a week.

London Transport Reorganisation of Central Area Operating Divisions.—The London Transport Executive has announced that from October 31, the Central Road Services operating organisation is to be modified. The present four Divisions will be reduced to three, to be designated West, East and South. They will be under the control of Mr. J. B. Burnell, Operating Manager (Central Road Services). Reference is made to appointments on page 517.

Withdrawal of Passenger Train Service between Aintree Central and Gatacre.—The passenger service between Aintree Central and Gatacre, in the London Midland Region, British Railways, is to be withdrawn from November 7. The following stations will be closed to passenger and parcels traffic: Aintree Central, Warbreck, Clubmoor, West Derby, and Knotty Ash. Parcels will be dealt with at Liverpool. Aintree Central will continue to deal with horsebox traffic and special passenger trains on Grand National race day. Bus services operate in the area.

Steel Company of Wales Improved Production.—The completion of the larger units in the third development plan of the Steel Company of Wales has resulted in increased production figures for the 53 weeks of the year ended October 1. Compared with 1959 (53 weeks), coke production has been increased by over 400,000 tons, pig iron by over 500,000 tons, and steel ingot output rose by 435,000 tons. Plate production has decreased slightly, but tinplate production increased by about 90,000, and sheet tonnage has risen to 200,000 tons above the 1959 figure. The company has not yet had the benefit of the new plant for a full 12 months.

Football Specials Suspended through Staff Shortage.—British Railways, London Midland Region, has announced that because of a shortage of train crews and other key staff in the London area, the usual special shuttle service of trains between Marylebone and Wembley Stadium on November 3, on the occasion of the England v. Wales international football match is to be suspended. Normal services will operate from Marylebone on this date, and there will be the usual frequent service of electric trains from Euston to Wembley Central station. The service was suspended on October 26, the day of the match between England and Spain.

Railway Correspondence & Travel Society Administrative Changes.—Pressure of business has compelled Mr. R. D. Goddard, Chairman of The Railway Correspondence & Travel Society, to resign from this position, and Mr. D. R. Pollock has been appointed to succeed him. For similar reasons Mr. T. J. Eggington has also left the Management Committee of the Society, and Mr. A. R. Brown and Mr. D. R. Smith have joined the Management Committee to fill the vacancies thus created. Because of the increasing work entailed in Society publications, it has been decided to separate the administrative aspect of this from that of *The Railway Observer*, and with effect from January 1, 1961, Mr. E. V. Fry, at present Hon. Chief Editor of *The Railway Observer*, will devote his attention entirely to this work, which will include general co-ordination in connection with the revised edition of *Locomotives of the L.N.E.R.*, *The Locomotives of the Great Western Railway*, *The Locomotives of the South Eastern & Chatham Railway*, and other future publications. Mr. A. R. Brown, at present Hon. Publicity Officer, will assume the duties of Hon. Chief Editor of *The Railway Observer*.

George Cohen Australia Scrap Co. (Pty.) Ltd.—The George Cohen Australia Scrap Co. (Pty.) Ltd., has been registered in Melbourne with a nominal capital of £A1 million. The new company will be jointly owned by the George Cohen 600 Group, of London, and Tubemakers of Australia (Pty.) Ltd.

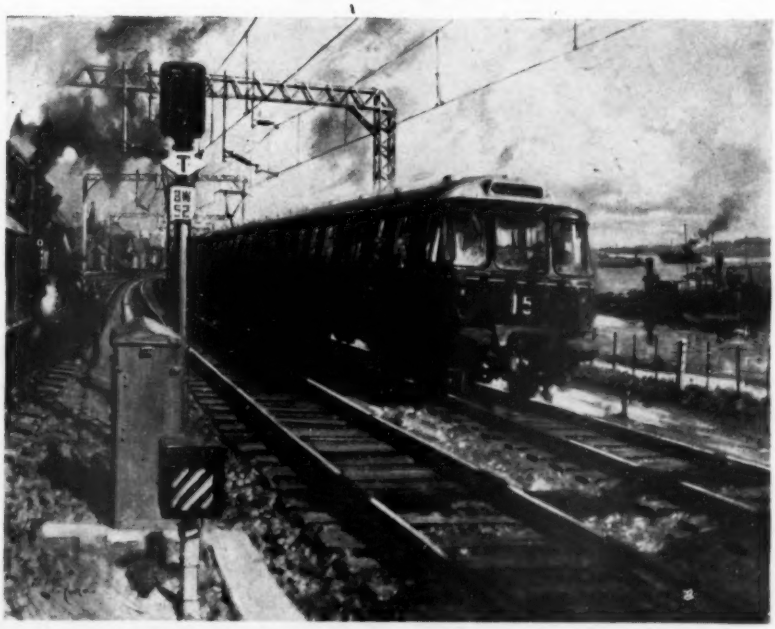
Institution of Civil Engineers Presidential Address.—Sir Herbert Manzoni, President of the Institution of Civil Engineers for the 1960-61 session, who has been acting in that capacity since the death of Mr. A. C. Hartley, President for 1959–60, in January of this year, will make his Presidential address to the Institution on Tuesday, November 1. The meeting will be held at the Institution of Civil Engineers, Great George Street, London, S.W.1, at 5.30 p.m.

Metal Fatigue Investigation by O.E.E.C.—Amongst discoveries resulting from investigation of metal fatigue under the auspices of the Organisation for European Economic Co-operation (O.E.E.C.) is that steel subjected for a short period to extreme stresses reacts in a manner diametrically opposed to that of some light alloys. This was announced at a meeting of the working party on fatigue failure in metals, organised by the O.E.E.C. European Productivity Agency. More than 500 test pieces have been tested to destruction, with emphasis on the effects of variations in the degree of stress applied. Tests are being carried out in nine European countries, in the U.S.A., and in Canada. Work is now to begin on 5,000 test pieces. They will be tested for varying periods at four different stresses, known as S1, S2, S3, and S4. Preliminary work showed that steel subjected to stress of S4 (70 kg. per sq. mm.) severity for even a short time subsequently cracked up very fast under much lower stresses, S1 or S2. The effect on various light alloys, however, was to harden and strengthen them so that they subsequently stood up better to prolonged periods of moderate stress than they did when not subject to an initial period of high stress.

Simpler Southern Region Fares.—The Southern Region of British Railways has announced the first move in a new drive to simplify its complicated range of bargain fares. The intention is to reduce the number of different excursion fares to, and from, London, most of them affecting places on the coast, and to cut out the difference between the prices for the same excursions at various times of the day. As an experiment, separate day, half day and evening excursion tickets will disappear at the end of October from the lines running into Sussex, and Hampshire from Victoria. Instead there will be one type of ticket called a day ticket which will be sold all day, except during the business travel period, and on the busiest Saturdays.

Pollard Ball & Roller Bearing Co. Ltd. Interim Dividend.—The Pollard Ball & Roller Bearing Co. Ltd. is maintaining its interim dividend at 5 per cent in respect of 1960 on capital increased by a one-for-four scrip issue. A final of 14 per cent on the capital to be raised by a proposed rights issue and a further one-for-two scrip issue has been forecast. For the previous year the final was 20 per cent on the old capital. Group net profit, before tax, for the six months to June 30, 1960, is £271,000 compared with £238,000 for the same period of the previous year. It is expected that, subject to the maintenance of present conditions and in the absence of unforeseen circumstances, the results for the second half of

Scottish Region Publicity



Poster prepared by the Public Relations & Publicity Department, British Railways, Scottish Region, for the Glasgow suburban electrification scheme. The artist is Terence Cuneo

1960 will be equally satisfactory. The expansion of production facilities has continued satisfactorily during the current year and has involved large capital outlays for additional land, buildings and plant for the production of ball and roller bearings. An extra-ordinary meeting for the purpose of increasing the capital to £1·5 million by the creation of 3·5 million ordinary 4s. shares will be held at Winchester House, London, EC, on November 4.

Forthcoming Meetings

October 29 (*Sat.*).—Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Railway Hotel, Brighton, at 7 p.m. "The Main Line of the L.B.S.C.R.," Mr. O. J. Morris.

October 31 (*Mon.*).—The Institution of Mechanical Engineers, at 1 Birdcage Walk, London, S.W.1, at 6 p.m. "Rolling Bearing Problems—Is there a Need for Fundamental Research ?"—Applied Mechanics and Lubrication Groups, Discussion.

November 1 (*Tue.*).—The Institution of Civil Engineers, at Great George Street, London, S.W.1, at 5.30 p.m. Presidential Address by Sir Herbert Manzoni.

November 1 (*Tue.*).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, at the Angel Hotel, Cardiff, at 6.30 p.m. "The Future Place of Railways in British Transport," Mr. G. F. Fiennes.

November 1 (*Tue.*).—The Institute of Transport, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.15 p.m. Anniversary Luncheon.

November 1 (*Tue.*).—The Institute of Traffic Administration, Bristol Branch, at the Grand Hotel, Bristol, at 7.30 p.m. "Traffic Licensing," Mr. T. D. Cooper,

November 1 (*Tue.*).—The Institute of Traffic Administration, Portsmouth & Southampton Branches joint meeting, at the Solent Hotel, Portsmouth, at 7 p.m.

November 1 (*Tue.*).—Railway Correspondence & Travel Society, Sheffield Branch, at Livesey Clegg House, Union Street, Sheffield, at 7.30 p.m. "Lesser-known Branches in the North East," Mr. T. E. Rounthwaite.

November 2 (*Wed.*).—The Newcomen Society, at the Science Museum, South Kensington, London, S.W.7, at 5.30 p.m. "The Talyllyn Railway," Mr. L. T. C. Rolt.

November 2 (*Wed.*).—The Institution of Mechanical Engineers, at 1, Birdcage Walk, London, S.W.1, at 6 p.m. "The Days of the Diesel Engine are Numbered." — Internal Combustion Engine Group Discussion.

November 2 (*Wed.*).—Institute of Traffic Administration, London Centre, at Caxton Hall, London, S.W.1, at 6.30 p.m. "Responsibilities of Carriers & Warehousekeepers for Customers' Goods."—Mr. D. Perkins.

November 2 (*Wed.*).—Electric Railway Society, at Fred Tallant Hall, Drummond Street, London, N.W.1, at 7.15 p.m. "Electrification Embraces London, 1890–1923." — Mr. G. T. Moody.

November 2 (*Wed*).—Institute of Traffic Administration, Kent Branch, at Sun Hotel, Chatham, at 7.45 p.m. "The New Medway Bridge."—Mr. R. M. Willis.

November 3 (*Thu.*).—Institution of Mechanical Engineers and Institution of Electrical Engineers, joint meeting, at Great George Street, London, S.W.1, at 5.30 p.m. "The Training of Overseas Graduate Engineers with Particular Reference to the F.B.I. Scholarship Scheme."—Mr. W. Abbott.

November 3 (*Thu.*).—British Railways (Western Region) Lecture & Debating Society, London and Bristol Sections joint debate, at Headquarters Staff Dining Club, Paddington, at 5.45 p.m. Motion "That there is an Over-Provision of Passenger Services to the Detriment of Freight Traffic."

November 4 (*Fri.*).—The Railway Correspondence & Travel Society, Scottish Branch, at Charlotte Square, Edinburgh, at 7.30 p.m. Film show by Mr. W. A. Camwell.

November 4 (*Fri.*).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, London, E.C.4, at 7 p.m. "Some Interesting Continental Locomotives."—Dr. P. Ransome-Wallis.

November 5 (*Sat.*).—Institute of Traffic Administration, Preston Branch, at the Royal Oak Hotel, Chorley, at 7.30 p.m. Annual Dinner.

November 7 (*Mon.*).—The Institution of Mechanical Engineers, Newcastle Branch, at 6 p.m. "Economic Distribution of Steam," Mr. J. A. Robins.

November 8 (*Tue.*).—British Railways Bristol Lecture & Debating Society, at the Staff Association, Temple Meads Station, Bristol, at 6 p.m. "The Bus Industry and how best it can be integrated with Rail Services," Mr. I. R. Patey.

November 8 (*Tue.*).—The Institution of Civil Engineers, at Great George Street, London, S.W.1, at 5.30 p.m. "Some Contributions from Nuclear Power to Engineering Practice," Mr. I. Davidson.

Railway Stock Market

With international uncertainties, reflected by the big flurry in the price of gold, affecting sentiment, the trend in stock markets has been reactionary, though later, the lower values attracted attention. Buyers appear to be going cautiously until after the American presidential election. The City is now resigned to the belief that an early end of the credit squeeze cannot be expected, though in some quarters it is apparently still assumed there may be a reduction in the bank rate in the next few weeks.

Very little movement was shown among foreign rails, which is not surprising because quotations were scarcely tested by dealings. Antofagasta stocks, however, have steadied, the ordinary at 12½ and the preference at 32½, both being unchanged as compared with a week ago; the 4 per cent perpetual debentures remained at 45½. Chilean Northern first debentures were again 54½. Costa Rica ordinary changed hands down to 37 but continued to have a "middle" quotation of 38½. United of Havana second income stock kept at 6 and Brazil Rail bonds at 5½. Sao Paulo Railway 3s. units continued at 1s., but elsewhere, Mexican Central "A" bearer debentures at 60 lost part of their recent advance.

International of Central America shares were $28½ and the preferred $111. Paraguay Central prior debentures kept at 15 and Guayaquil & Quito bonds were 105 with the assented bonds 69½.

Canadian Pacifics at $38⅜ were only fractionally lower compared with a week ago, while the preference stock strengthened from 61¾ to 62, though the 4 per cent debentures eased to 62⅛. White Pass shares firmed up to $10⅞.

West of India Portuguese capital stock was again quoted at 110½ and the 5 per cent debentures at 93. Nyasaland Railway shares and debentures were 9s. and 44½ respectively. Gedaref Railway 5 per cent guaranteed debentures were quoted at 96.

Best feature among shares of locomotive building, engineering and kindred companies has been a rally in Gloucester Wagon 10s. shares from 9s. 9d. a week ago to 11s. 3d. on further consideration of the report and accounts and chairman's annual statement.

G. D. Peters were 13s. 9d., but on the latest news of unprofitable working, North British Locomotive have fallen, 9s. 3d. to 7s. 9d. Profit-taking following their recent advance put Wagon Repairs 5s. shares back from 20s. 3d. to 18s. 9d. Charles Roberts 5s. shares eased from 9s. 6d. to 9s. with the general trend. Westinghouse Brake lost a few pence at 44s. 6d. and Birmingham Wagon were 32s. 6d., compared with 33s. 9d. a week ago.

Stone-Platt moved against the prevailing trend, having risen on balance from 60s. 3d. to 62s. and Ransome & Marles were helped by the good results, these 5s. shares having moved up from 27s. to 28s. Pollard Bearing 4s. shares, however, were marked down, and at 49s. 9d. compared with 51s. 3d. a week ago.

Babcock & Wilcox were steadier at 33s. 6d. and Hopkinsons were marked up sharply to 112s. 6d., but in other directions, T. W. Ward lost 1s. at 75s. and British Oxygen 5s. shares were 1s. 9d. down at 29s. 6d. Pressed Steel 5s. shares have eased from 27s. 3d. to 26s. 9d. and Dowty Group 10 s. shares moved slightly lower at 36s. 9d. Renold Chain declined from 39s. 6d. to 38s.

Electrical shares also reflected the general market trend with Associated Electrical back from 43s. 3d. to 42s. 9d. General Electric at 35s. and English Electric at 34s., however, were inclined to improve, though it may be some while before there is a decision on a merger between the two last-named companies.

OFFICIAL NOTICES

LOCOMOTIVE FOR SALE

FOR sale due to dieselisation, 3-ft. 6-in. gauge Beyer-Garret 2-8-2 + 2-8-2 coal burning locomotive, built in 1936 by Beyer Peacock, having a tractive effort of 46,140 lb. at 75 per cent boiler pressure. Maximum axle load in full working order 13 tons, overall width 10-ft. 3-in., maximum height above rail level 13-ft.

This locomotive, which is in Sierra Leone, is in full working order and capable of being steamed within 12 hours (Boiler Certificate granted by Government Inspector, March, 1959).

For further details please apply to:—

SIERRA LEONE DEVELOPMENT Co. Ltd.
City Gate House, Finsbury Sq., London, EC2

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ENGINEERING GRADUATE preferred; minimum of two years engineering training essential.

Require two years varied railroad engineering service, or five years in direct charge of track crews. Will supervise 135 men maintaining 45 mile railroad, assign work, order materials, be responsible for safety, make regular detailed inspections of roadbed and all track on main line, sidings and yards, bridges, tunnels, etc. Will make engineering calculations relating to maintenance and use of structure and equipment. Must speak Spanish. Married or single candidates acceptable.

Excellent opportunity large copper company, Chile, South America. Two year contract with transportation both ways for you and family. Basic salary $525.00 to $650.00 per month depending upon age and experience of applicant.

Box 6, The Railway Gazette, 33 Tothill Street, S.W.1.